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INDUCTION OF ABORTION AND LABOUR BY MEANS OF OESTRIN

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As a result of the experimental work of many investigators it has been established that progestin and oestrin have a contrary effect upon the uterus, and that while the one inhibits, the other stimulates, the spontaneous activity and the responsive sensitivity of the uterine muscle. On these grounds it is believed that during pregnancy expulsive contractions remain in abeyance so long as a state of equilibrium is maintained between these antagonistic hormones, and that the onset of labour (or abortion) is preceded by a failure of equilibrium whereby the stimulating factor gains ascendancy and leads to the spontaneous evacuation of the products of conception.

Following upon the introduction of this idea of the hormonic control of pregnancy, many attempts were made to induce labour by means of ovarian extracts, and it was expected that the exhibition of oestrin, if given in large enough doses, would override the inhibitory effect of the corpus luteum, and so afford a method of inducing abortion or the premature onset of labour. Such experiments have been almost uniformly successful when applied to animals such as the rodents, but they have been a complete failure in the human subject. We believe that one or more of the following reasons may account for this lack of success.

1. Any conception of the hormonic balance as a simple equation existing between progestin and oestrin is misleading; it is quite certain that in rodents the corpus luteum is the chief inhibitory hormone, but this is not true for the human subject, because the result of many operations has proved that the removal of the corpus luteum has no effect upon the human pregnant uterus so long as the operation is carried out after the sixth week of gestation. Reynolds[1] has shown, and we ourselves have confirmed his work,[2] that the inhibition of the human uterus is also due to the direct action of the anterior pituitary hormone, prolan.

2. Many workers have assumed that oestrin must perforce overcome progestin if given in sufficient quantity, whereas animal experiments[3] have shown that it is not always possible to overcome the action of small doses of progestin by very large amounts of oestrin.

3. Other sources of failure have been the impurity of the preparations used for experimental purposes and the marked variations that such preparations have shown in their hormonic content.

4. Sometimes the method of administration has been at fault, and the hormone has been injected with a view to a direct excitation of the uterine muscle comparable to that obtained by the action of the pituitary. But, as we were among the first to point out,[2 4] oestrin is not directly oxytocic; it has no effect whatever upon the isolated uterus, and its influence is only to be seen when it is administered parenterally to the animal organism; and then some time must elapse before its action can become manifest.

Before describing the results of the present research we propose to restate our own views concerning the action of the follicular hormone, and to indicate the principles upon which we have based our experiments. We believe that oestrin produces its effect in at least three different ways, and of these the second is by far the most important: (1) by causing hypertrophy of the muscle fibres and general hyperaemia of the uterus; (2) by sensitizing the muscle and nerve elements of the uterus; (3) by stimulating the production of infundibulin in the body.

The preparation of oestrin in a pure and concentrated form has provided us with an opportunity for putting these views to an experimental and clinical test. The results we have obtained are in some respects surprising, but we believe that they throw fresh light upon the hormonic control of uterine activity during pregnancy and labour, and demonstrate that the state of activity of the uterus is essentially dependent upon the relative quantity and quality of oestrin, progestin, and prolan in the blood stream.

Oestrin Preparations Used

The oestrin preparations used were "oestroform" (10,000 international units per c.cm. in the earlier, and 100,000 international units per c.cm. in the later experiments), and we are indebted to the British Drug Houses for a liberal supply of this preparation at a greatly reduced cost. Latterly "dimenformone" (10,000 and 100,000 international units per c.cm.) has also been used, and we are grateful to Dr. Alison Macbeth, scientific investigator to Organon Laboratories, for free supplies of this special preparation.

Animal Experiments

Parkes[5] and other workers have shown that the administration of oestrin rarely fails to produce abortion at any period of gestation in the smaller rodents. Parkes has also demonstrated that the follicular hormone sensitizes the mouse uterus to the action of pituitrin, and that an interval of time must elapse between the administration of the hormone and the onset of expulsive contractions. This known abortifacient action upon the rodent uterus may be employed as a means of testing the activity of any preparation containing oestrin, and with this purpose in view we carried out a series of preliminary experiments in which we injected the preparation of hormone into a number of pregnant rabbits. For the most part we used oestroform containing 10,000 international units per c.cm., and the results are shown in Table I.

TABLE I.—*Induction of Abortion in Rabbits*

No.	Duration of Pregnancy	Total Amount of Oestroform 10,000 units per c.cm.	No. of Injections	Interval of Time between Injections	Results. Period of Time is Expressed in Hours after First Injection
1	22 days	1.35 c.cm.	5	8 hours	Abortion in 120 hours
2	22 ,,	1.68 ,,	6	8 ,,	,, 36 ,,
3	22 ,,	1.93 ,,	7	8 ,,	,, 144 ,,
4	17 ,,	1.10 ,,	4	12 ,,	,, 86 ,,
5	8 ,,	0.75 ,,	3	12 ,,	,, 90 ,,
6	14 ,,	0.78 ,,	3	12 ,,	,, 90 ,,
10	13 ,,	0.10 ,,	1	—	Abortion at some time between 90 and 180 hours
11	12 ,,	0.10 ,,	1	—	Abortion in 36 hours
12	14 ,,	0.05 ,,	1	—	Abortion at some time between 48 and 144 hours
13	11 ,,	0.05 ,,	1	—	Abortion in 144 hours
14	9 ,,	0.05 ,,	1	—	,, 163 ,,
15	9-10 ,,	0.05 ,,	1	—	Failure to produce abortion; normal delivery at term
16	14 ,,	0.05 ,,	1	0.5 c.cm. pituitrin given 12 hours after oestrin	Abortion in 96 hours
17	9 ,,	0.05 ,,	1	—	Abortion at some time between 43 and 100 hours
25	15 ,,	0.10 ,,	1	—	Abortion in 120 hours
26	14 ,,	0.10 ,,	1	—	,, 120 ,,
27	14 ,,	0.05 ,,	1	—	,, 110 ,,

Seventeen experiments were performed, and one or more injections of the oestroform were given subcutaneously in each case. The diagnosis of pregnancy was made by palpation and by correlating the physical signs with the time of copulation. The occurrence of abortion was determined by palpation, and confirmed on four occasions by killing the animal immediately after the uterus had emptied itself. It was not always easy to decide the exact time at which abortion had occurred, but, over the whole series, the average time taken to produce abortion was 109 hours as calculated from the time of the first injection, the shortest period being thirty-six hours in Case 2 and the longest interval 180 hours in Case 10. In sixteen cases abortion was successfully induced, and in one case only did the pregnancy continue to term. In this instance it should be noted that the pregnancy was advanced nine days only, and that a very small amount of oestrin (500 international units) was given.

Since oestroform is a preparation of ovarian hormone in castor oil, we felt it necessary to control these experiments by the administration of castor oil alone. Four pregnant rabbits were given 5 c.cm. of castor oil by repeated subcutaneous injections, and in each case the pregnancy was unaffected, although the amount of oil given was much greater than that injected as a vehicle for the oestroform. Having made certain that our preparation was actively abortifacient to rabbits, we then proceeded to test its effects upon the human subject.

Scope of Investigation in the Human Subject

At the outset we determined to base our method of administration upon the known biological properties of the hormone. We argued that if oestrin produces its effects by sensitizing the uterine muscle, then it ought to be given in repeated doses, and the peak of sensitivity should not be reached until at least 100 hours had elapsed since the administration of the first dose. We hoped that the uterus might become so sensitized by the injection of oestrin that any further stimulation would be unnecessary, but we decided that if labour or abortion did not commence when the uterus reached this peak of sensitivity then we ought to try the effect of an oxytocic agent such as quinine or pituitrin.

We realized that the giving of this substance would affect the issue to some extent, but we did not think it would materially affect our observations on the action of oestrin, because it is well known that neither pituitrin nor quinine has much, if any, effect upon the uterus until the patient is near or at full term.

Based upon these principles an attempt was made to induce abortion and premature labour in a series of forty cases. For descriptive purposes we have divided the results of these experiments into four groups: (1) induction of therapeutic abortion; (2) induction of premature labour in normal pregnancy; (3) induction of labour in abnormal pregnancy; and (4) induction of labour in cases of missed abortion or intrauterine death of the foetus.

The Induction of Abortion

This method was used with the object of inducing therapeutic abortion on twelve occasions (Table II). In each case the medical indication for the termination of pregnancy was a general one and the local condition was apparently normal; the duration of pregnancy varied from seven to fourteen weeks. In no case was abortion induced, although in three instances uterine haemorrhage and definite intermittent painful uterine contractions occurred at the expected time. In a fourth case the patient experienced a sensation of an impending menstrual period.

Although these results are in one way disappointing they nevertheless add something to our knowledge of the action of oestrin, for whatever the reason of failure may be it can hardly be lack of adequate dosage. Our results strongly support the view that the normal balance which exists during pregnancy between the sensitizing and the inhibitory hormone is not directly a quantitative one.

The Induction of Premature Labour

Normal Pregnancy of more than Twenty-eight Weeks' Duration

Attempts to induce premature labour were made ten times (Table III). In five cases labour resulted from this treatment, although in one of them we were left in some doubt as to whether we could fairly attribute the successful result to the influence of the hormone because the pains came on so quickly after the first injection had been given. In one other case uterine contractions appeared but passed off again without bringing the patient into labour. In the remaining four cases the injections had no discernible effect upon the uterine muscle. It must be remembered that with two exceptions, of which one only was successful, all these patients were given quinine and

TABLE II.—*Induction of Abortion (Normal Pregnancy of less than Twenty-eight Weeks' Duration)*

No.	Duration of Pregnancy	Preparation Used	Total Dose in International Units	No. of Injections	Interval between Injections	Additional Substances given 100 hours (approx.) after First Injection	Results
7	10 weeks	Oestroform	100,000	5	12 hours	Pituitrin 0.5 c.cm. × 4; Quinine 10 grains	Patient commenced to bleed at 120 hours after first injection, but abortion did not proceed
8	12 ,,	,,	50,000	5	12 ,,	None	No effect
9	13 ,,	,,	60,000	6	Irregular for 6 days	Pituitrin 0.5 c.cm. × 4; Quinine 10 grains × 3	,,
14	10 ,,	,,	120,000	6	12 hours	Quinine 10 grains × 3	Painful uterine contractions and slight bleeding 72 hours after first injection. Patient had a mental impression of impending menstruation
16	12 ,,	,,	120,000	6	12 ,,	Quinine 10 grains × 3	No effect
17	7 ,,	,,	600,000	6	12 ,,	Quinine 10 grains × 3	Patient experienced a sense of impending menstruation about 100 hours after first injection
23	10 ,,	Oestroform and Dimenformone	3,200,000	32	8 ,,	Quinine 10 grains × 3; Pituitrin 0.5 c.cm. × 4	Patient commenced to bleed and had painful uterine contractions at 160 hours after first injection. (At that time she had received 1,900,000 units.) Bleeding continued for four days, but abortion did not proceed
26	14 ,,	,,	6,800,000	34	8 ,,	Quinine 10 grains × 3; Pituitrin 0.5 c.cm. × 3	No effect
27	10 ,,	Oestroform	1,800,000	18	4 ,,	Quinine 10 grains; Pituitrin 0.5 c.cm. × 3	,,
28	12 ,,	,,	4,200,000	42	4 ,,	Quinine 10 grains; Pituitrin 0.5 c.cm. × 3	,,
32	10 ,,	,,	3,000,000	30	4 ,,	Pituitrin 0.5 c.cm.	,,
33	14 ,,	,,	2,500,000	21	4 ,,	Pituitrin 0.5 c.cm. × 4	,,

TABLE III.—*Induction of Labour (Normal Pregnancy of more than Twenty-eight Weeks' Duration)*

No.	Duration of Pregnancy	Preparation Used	Total Dose in International Units	No. of Injections	Interval between Injections	Additional Substances given 100 hours after First Injection	Results	Comments
4	30 weeks	Oestroform	70,000	5	12 hours	Pituitrin 0.5 c.cm. × 4	Failed	No effect.
5	37 ,,	,,	50,000	5	12 ,,	Pituitrin 0.5 c.cm. × 4	,,	Intermittent painful contractions occurred at 100 hours after first injection, but passed away after a few hours.
11	38 ,,	,,	100,000	5	12 ,,	Quinine 10 grains × 3	Successful	Patient had had pain and uterine haemorrhage and the cervix had reached two fingers dilatation before the quinine was administered; labour commenced 80 hours after the first injection.
12	38 ,,	,,	80,000	4	12 ,,	—	,,	Labour commenced 48 hours after the first injection. This early effect leaves one to doubt whether the onset of labour was due to oestrin.
13	37½ ,,	,,	120,000	6	12 ,,	Quinine 10 grains × 3; pituitrin 0.5 c.cm. × 4	Failed	No effect.
21	38 ,,	Dimenformone	1,200,000	6	12 ,,	Quinine 10 grains × 3; pituitrin 0.5 c.cm. × 4	Successful	Onset of labour at 100 hours after first injection. Duration of labour was only three hours, although patient had a contracted pelvis and a breech with extended legs.
22	39 ,,	,,	1,200,000	6	12 ,,	Quinine 10 grains × 3	,,	Onset of labour at 44 hours after first injection. It is to be noted that by the time labour ensued this patient was on term.
24	36 ,,	Oestroform	370,000	11	8 ,,	Pituitrin 0.5 c.cm. 12-hourly	Failed	No effect.
25	40 ,,	Dimenformone	1,600,000	16	8 ,,	Quinine 10 grains × 3	Successful	Onset of labour at 100 hours after first injection. Quinine induction prior to oestrin failed to induce labour.
37	240 ,,	Oestroform	2,000,000	10	8 ,,	—	Doubtful	No result in 100 hours after first injection. At that time the pregnancy was terminated by other means.

pituitrin in addition to oestrin, and that most of them were near full term when the treatment was begun. In such circumstances we recognize that labour may be induced by drugs alone, and hence we are unable to bring forward the present results as examples of the induction of labour by oestrin.

Nevertheless, we desire to emphasize the undeniable fact that in all the successful cases uterine contractions were unusually good and the labours were noticeably short. We have no doubt in our own minds that the lively condition of the uterine muscle was directly due to the sensitizing effect of the previously injected hormone. We must also record that we have never noticed any ill effects* either to mother or child following the administration of this hormone, although this experience is contrary to that of other observers.[6]

* In a more recent case (not included in this paper) a patient exhibited pyrexia and collapsed a short time after the administration of 20,000 international units of dimenformone. However, this was a case of retained placenta associated with obstetric shock, and we do not feel justified in regarding the symptoms as being due to the hormone preparation administered.

The Induction of Labour in Abnormal Pregnancy

These two cases are classified separately because in both instances there were local factors that may have been responsible for the onset of labour, and we therefore hesitate again to ascribe the onset of expulsive contractions to the effects of oestrin.

It will be noticed that in Case 3, a pre-eclamptic patient, convulsions occurred during labour that set in thirty-three hours after the injection of the hormone. The explanation of the onset of these fits is difficult. If it be true that one function of oestrin is to liberate secretion from the posterior lobe of the pituitary body, then it is theoretically possible that the oestroform injections may have played some part in the production of the convulsions. On the other hand it is a common clinical experience that the onset of labour itself (or merely the onset of individual uterine contractions during labour) is liable to initiate convulsions in any patient who is suffering from pre-eclampsia, and this explanation may well be the correct one in the present instance. Whatever the explanation, we do not consider that such a

TABLE IV.—*Induction of Labour in Abnormal Pregnancy*

No.	Abnormality	Duration of Pregnancy	Preparation Used	Total Dose in International Units	No. of Injections	Interval between Injections	Results
1	Twins with hydramnios	35 weeks	Oestroform	50,000	5	12 hours	Onset of labour 90 hours after first injection. In spite of hydramnios, the uterus contracted well and labour lasted only 9½ hours
3	Anencephalus pre-eclampsia	35 ,,	,,	20,000	2	12 ,,	Onset of labour 33 hours after first injection. Soon after pains commenced, patient commenced with eclamptic fits. Labour was complete after 23 hours

remote contingency as the development of fits should constitute a contraindication to the therapeutic use of oestroform.

Induction of Abortion or Labour in Cases of Intrauterine Death of the Foetus

It is to this group that we wish to draw special attention. Normally the death of the foetus is soon followed by the onset of labour (and the evacuation of the contents of the uterus), but in cases of missed abortion the foetus is retained *in utero* and the onset of labour does not supervene for a considerable and sometimes a long period. This interesting condition may be explained in two ways: it may be due to the persistence of those factors which normally inhibit uterine activity; or it may be due to the absence of those stimulating factors that normally bring about the onset of expulsive contractions.

who are suffering from missed abortion, and we are convinced that in all our successful cases the hormone alone was the primary and essential cause of the evacuation of the uterus.

Case 15 was most instructive. For many weeks this patient had been suffering from an attack of malaria, which had killed the foetus, but, in spite of the exhibition of massive doses of quinine, there had been no evidence whatever of uterine contractions or discharge. The uterus was clearly resistant to the effects of quinine, and yet, after a course of oestrin, quinine and pituitrin produced a painless labour lasting only three and a half hours.

With reference to these results, it is of great interest to note that Spielman, Goldberger, and Frank[7] in 1933 demonstrated that the retention of a dead foetus is characterized by the absence of a demonstrable amount of oestrin in the blood. This condition is in marked contrast to that

TABLE V.—*Intrauterine Death, including Missed Abortion*

No.	Duration of Pregnancy		Preparations Used	Total Dose in International Units	No. of Injections	Interval between Injections	Additional Substances given 100 Hours after First Injection	Result	Time of Abortion after First Injection	Remarks
	Dates	Physical Signs								
2	31 weeks	34 weeks	Oestroform	40,000	4	12 hours	Castor oil	Successful	150 hours	Bleeding and pain commenced before administration of castor oil. Macerated twins expelled
6	32 ,,	16 ,,	,,	100,000	5	12 ,,		,,	200 ,,	
10	26 ,,	16 ,,	,,	100,000	5	12 ,,		,,	80 ,,	Prior to administration of oestrin no dilatation of the cervix. Injections of quinine and pituitrin had failed to stimulate uterine contractions
15	28 ,,	22 ,,	,,	120,000	6	12 ,,	Quinine 10 grains × 3; Pituitrin 0.5 c.cm. × 4	,,	90 ,,	This patient had had malaria and this caused foetal death. She had massive doses of quinine as treatment of the malaria, but no pain or haemorrhage had occurred prior to the administration of oestrin
18	25 ,,	18 ,,	Progynon oleosum	1,100,000	7	12 ,,	Quinine 10 grains × 3; Pituitrin 0.5 c.cm. × 4	Failed		This patient commenced to bleed at 100 hours after first injection, but evacuation of the uterus did not proceed. She had had no previous bleeding
29	33 ,,	28 ,,	Oestroform	100,000	1			Successful	3 ,,	No pain or uterine haemorrhage before injection of oestrin
30	33 ,,	25 ,,	,,	1,400,000	10	8 ,,		,,	80 ,,	
31	36 ,,	30 ,,	,,	2,000,000	10	8 ,,	Pituitrin 0.5 c.cm. × 4; Ol. Ric.	,,	96 ,,	
34	26 ,,	10 ,,	,,	2,430,000	15	8 ,,	Quin.sulph. 10 grains × 3; Pituitrin 0.5 c.cm. × 4	,,	200 ,,	
35	28 ,,	10 ,,	,,	3,200,000	16	8 ,,	Pituitrin 0.5 c.cm. × 6; Quin.sulph. 10 grains × 3	Failed		Uterine haemorrhage and definite painful uterine contractions commence 120 hours after first injection. These passed away after a few hours
39	34 ,,	26 ,,	,,	1,600,000	8	8 ,,		Successful	66 ,,	No pain or discharge prior to administration of oestrin
40	24 ,,	20 ,,	,,	1,000,000	5	8 ,,		,,	36 ,,	

We believe that the results recorded in Table V put the issue beyond all doubt by demonstrating that the latter explanation is the correct one. In 83 per cent. of cases (ten out of twelve) evacuation of the uterus, weeks and even months after foetal death had occurred, was induced without mechanical interference by the injection of oestroform (? the missing factor). In the remaining two cases bleeding (previously absent) and painful uterine contractions were set up at the expected time, but the contractions were not sufficiently powerful (or sustained) to effect the expulsion of the products of conception.

In seven of the successful cases nothing but oestrin was used for the induction of labour, but in the remainder quinine and pituitrin were also administered. It is, of course, a well-known clinical fact that quinine and pituitrin alone have practically no effect upon women which obtains in normal pregnancy, and it was therefore put forward by these observers as a means of determining the occurrence of intrauterine death. This work has been recently confirmed by Dr. J. Polonsky, working in this department, and to him we are indebted for carrying out the test in six of our cases and demonstrating the absence of oestrin in the blood prior to the attempts at induction. We conclude that the reason why the foetus is retained *in utero* in cases of missed abortion is the absence of the normal sensitizing factor—oestrin—and that if this is supplied by the correct technique the uterus will empty spontaneously in most cases.

It is hardly necessary to emphasize the advantages accruing from the employment of a non-operative method of treating such cases, because it is well recognized that any mechanical interference is accompanied by a serious

risk of injury and sepsis to any patient who is suffering from missed abortion. The absence of bleeding and pyrexia was noteworthy in all our cases, and we are confident that the use of oestrin will prove to be of great value in the treatment of this condition.

It should be clearly understood that "missed" abortion is a definite clinical entity in which a dead ovum and placenta are retained *in utero* because the uterus has remained inactive, and, as it were, "missed" its chance of abortion. This condition of missed abortion is quite separate and distinct from incomplete abortion, which implies that abortion has taken place, but is incomplete because some of the products of conception are retained in the uterus. We wish to emphasize that while we claim that oestrin will empty the uterus in cases of missed abortion, we do not claim that the injection of this hormone will lead to the expulsion of pieces of retained placenta from the uterus of a patient suffering from incomplete abortion.

We have, more recently, attempted to induce abortion in a patient suffering from a mole which was partly carneous and partly vesicular in type. Nearly 2,000,000 international units of oestroform were administered. The attempt failed, and this result is to be expected on theoretical grounds. The excessive formation of prolan associated with hydatidiform mole makes it probable that the uterine musculature is inhibited even more than in normal pregnancy.

Administration of Oestrin for Uterine Inertia

These four cases stand by themselves, since it was impossible to devise any control experiments, but the results are of exceptional interest, and they are in complete agreement with our view of uterine inertia as expressed elsewhere. Moreover, they open up possibilities of a harmless and effective treatment for a condition which entails much difficulty for the obstetrician and great risk to both mother and child.

We wish to draw special attention to Case 36. At her first confinement this patient was in labour for some days, and although there was no evidence of mechanical disproportion Caesarean section was eventually performed on account of defective action of the uterus and failure of the cervix to dilate further than two fingers. In the present confinement she was found to have twins with hydramnios causing overdistension of the uterus. Before the administration of oestrin she had been in labour for six days, and during the last four the cervix had remained at two to three fingers dilatation. Uterine contractions were feeble and very infrequent, and the administration of quinine had failed to influence the contractions to any appreciable extent. Very soon after the administration of oestrin, regular and strong uterine contractions set in and delivery was completed within eight and a half hours from the first injection of the hormone.

Conclusions

1. We believe that the results brought forward support the view that oestrin is the main sensitizing factor of the human uterus.

2. We find that it is impossible to overcome the inhibitory phase of the normal pregnant uterus by the injection of very large quantities of the non-stimulating factors, and we confirm our belief that the hormone balance in normal pregnancy in the human being is not maintained simply by the relative quantities of progestin and oestrin. We confess to some feeling of relief in our inability to procure abortion by means of oestrin, because we are convinced that if this method were reliable it would indubitably lead to a great increase in the number of unnecessary inductions and criminal abortions.

3. Our clinical results have shown that when administered near term oestrin may or may not induce premature labour, but that it is not a reliable means of induction. It is an especially unsuitable method for cases in which it is necessary to bring on labour immediately because of the uncertain interval (up to seven or eight days) that intervenes between the commencement of treatment and the onset of expulsive contractions.

4. Our experience has demonstrated that oestrin is the best method of evacuating the uterus in cases of missed abortion or intrauterine death of the foetus. The method when correctly carried out is successful in at least 80 per cent. of cases, and it has the additional merit of being free from risk. The patient has the discomfort of several intramuscular injections, but she is immune from the danger of uterine trauma, infection, and haemorrhage.

5. Finally, we are led to hope that oestrin will prove to be of value in dealing with primary uterine inertia, for our results have shown that the response to oestrin therapy is dramatic and that it entails no risk to either mother or child. This treatment is at present expensive, but we have so far made no attempt to determine how little or how much of the hormone is required for therapeutic use, and it is quite possible that the amount we have been using may have been unnecessarily large.

TABLE VI.—*Administration of Oestrin for Uterine Inertia*

No.	Duration of Pregnancy	Conditions Present	Preparation Used	Total Dose	No. of Injections	Interval of Time between Injections	Results
19	40 weeks	L.O.P.; membranes ruptured. No contractions for four days	Dimenformone	20,000	2	6 hours	Onset of pain 8 hours from first injection. Low forceps for foetal distress. Rapid advance
20	37 ,,	V.D.H.; membranes ruptured for three days. No contractions	,,	1,300,000	7	12 ,,	Pain and show after second injection. Definitely in labour 100 hours from first injection. Rapid delivery
36	38 ,,	Twins with hydramnios. Six days in labour. Cervix three fingers for four days in spite of quinine, etc., previous pregnancy Caesarean, for non-dilatation of cervix	Oestroform	800,000	4	2 ,,	Delivered in 7 hours from first injection. One foetus dead and one alive
38	40 ,,	Adipose multipara. R.O.P.; four days in labour. Weak and infrequent pains. No advance. Cervix not dilating	,,	700,000	7	—	Improvement in pains soon after commencing treatment. Delivery completed within 12 hours of first injection. Low forceps

We desire to express our gratitude to Dr. A. S. Parkes of University College, London, for his valuable help and advice, and also to thank our colleagues at the Maternity Hospital and the Royal Infirmary, Liverpool, for allowing us to carry out this form of treatment upon patients under their care and for permitting us to report the results incorporated in this paper.

REFERENCES

[1] Reynolds, S. R. M.: *Proc. Soc. Exp. Biol. and Med.*, 1932, xxx, 59; *Amer. Journ. Physiol.*, 1932, c, 545.
[2] Blair-Bell, W., Datnow, M. M., and Jeffcoate, T. N. A.: *Journ. Obstet. and Gynaecol. British Empire*, 1933, xl, 541.
[3] Reynolds, S. R. M.: *Amer. Journ. Physiol.*, 1931, xcviii, 230.
[4] Jeffcoate, T. N. A.: *Journ. Obstet. and Gynaecol. British Empire*, 1932, xxxix, 67.
[5] Parkes, A. S.: *Journ. of Physiol.*, 1930, lxix, 463.
[6] Macbeth, Alison: Personal communication.
[7] Spielman, F., Goldberger, M. A., and Frank, R. T.: *Journ. Amer. Med. Assoc.*, 1933, ci, 266.

HAY FEVER: ITS IMMUNOLOGICAL MECHANISM, DIAGNOSIS, AND TREATMENT

BY

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Hay fever is a type of paroxysmal rhinorrhoea due to hypersensitivity to the pollen of the grasses. The well-known symptoms are produced in the sensitive subject by the application of pollen to the upper respiratory tract and eyes. Normally this occurs only during the pollinating season of the grasses (early summer), when the widely disseminated air-borne pollen reaches the sensitive person, but the same symptoms can be produced artificially at any other time of the year by applying preserved pollen or pollen extract to the mucous membrane. This condition is frequently referred to as "seasonal hay fever" in contradistinction to "perennial hay fever," a type of paroxysmal rhinorrhoea due to hypersensitivity to non-seasonal products such as animal dandruffs, orris root from face powder, etc.

This loose usage is confusing and undesirable, and the term "hay fever" should be confined to hypersensitivity to grass pollen, as Noon and Freeman have always recommended. True, the term is often applied in America and some other countries to paroxysmal rhinorrhoea caused by the ragweeds (absent in this country), but this is usually and more fittingly described as ragweed fever. The pollens of trees, weeds, and flowers are rarely a cause of paroxysmal rhinorrhoea in this country, although the autumn compositae (particularly the Michaelmas daisy) do produce a few cases (Freeman[2]).

The Immunological Mechanism

When pollen extract is applied to the skin of the hay-fever subject the following changes take place at the site of contact: (1) primary dilatation of the minute blood vessels; (2) increased permeability of the vessel walls leading to exudation of plasma; and (3) reflex dilatation of the surrounding arterioles. This has been shown by Lewis[8 9 10] to be the mechanism of the allergic reaction, and incidentally the reaction of the skin to a variety of other forms of cellular damage. These changes are most conveniently demonstrated in the hay-fever subject by placing a drop of pollen extract on the skin of the forearm and pricking the skin with a needle through the drop; the well-known urticarial wheal and a surrounding erythema develop in ten to fifteen minutes. The normal skin is insensitive to such treatment with pollen extract.

The amount of pollen required to produce a well-marked reaction to the hay-fever subject's skin is exceedingly minute, a few millionths of a gram of dried pollen or its equivalent amount of extract. The symptoms vary with the locality of the sensitized tissue acted upon by the extract; thus urticaria is produced in the skin, asthma in the lungs, hay fever in the upper respiratory tract, etc. If a suitable dose of pollen extract is given intravenously to a hay-fever case the active principle of the extract is carried round the body by the blood, and urticaria, asthma, hay fever, and certain other conditions result simultaneously.

When a small quantity of serum from a hay fever subject is injected into the skin of a normal person, the serum is rapidly absorbed and the skin resumes its normal appearance. Subsequently, on injecting pollen extract into the same area, a wheal and erythema develops identical with that seen on injecting the extract into the skin of the hay-fever subject. If, instead of injecting the extract into the site of the serum injection, it is injected (in suitable quantity) subcutaneously or intravenously in a distant part of the body, the active principle is carried round in the blood and produces the same reaction at the site of the serum injection.

This transfer of hypersensitivity to the skin of normal persons was first described in 1921 by Prausnitz and Küstner.[11] Cases have been recorded of blood transfusion from hypersensitive individuals to non-sensitive persons leading to a condition of general hypersensitiveness in the latter. The property of serum from the hypersensitive subject to sensitize normal skin is assumed to be due to the presence in that serum of a sensitizing antibody, the allergic reagin or allergin, which has been aptly named "idioceptor" by Freeman.[3] When idioceptor is attached to tissue cells the latter produce the allergic reaction on contact with the active principle of the specific reaction-producing substance (the allergen, atopen, or more fittingly "idiotoxin").

When a passively sensitized skin site is acted upon by the specific idiotoxin in sufficient quantity to elicit the maximum reaction, the site becomes desensitized—that is, the idioceptor is inactivated or destroyed, and the site does not give any reaction to further treatment with idiotoxin. If, however, a submaximal dose of idiotoxin is given in the first place, some idioceptor escapes inactivation, and a second reaction can be produced by another injection of idiotoxin (Harley[6]). If a mixture of idiotoxin with idioceptor is injected into the normal skin the ensuing reaction is similar to that in which the idioceptor is injected first and the idiotoxin after an interval, though the former reaction develops more slowly.

Incubating such mixtures at 37° C. for various periods was found to be without effect on their power to produce reactions in normal skins; it appears that idioceptor and idiotoxin are not mutually inactivated *in vitro*, though it has been shown that a definite linkage occurs.[6] The inactivation of idioceptor by idiotoxin takes place only *in vivo*—that is, by allergic reaction involving tissue cells. The reaction of the sensitized skin to the specific idiotoxin is similar to, if not identical with, that of the skin to histamine (Lewis[8 9 10]), and modern opinion is that histamine itself is liberated from the sensitized cells by the action of idiotoxin on the latter, and this histamine produces the actual changes in the blood vessels and smooth muscle fibres which constitute the allergic reaction. The liberation of histamine by the cells is the result of damage to them, and the allergic reaction is simply the expression of cellular damage produced by the special method of specific idiotoxin-idioceptor union on or in the cells.

The desensitization of hay-fever patients by repeated injections of pollen extract is the result of inactivation of idioceptor, as shown by the abolition of the patient's skin sensitivity and serum idioceptor. Specific desensitization is a series of mild extensive allergic reactions, and therefore entails the repeated liberation of histamine in the body by the action of renewed doses of pollen extract on the sensitized cells. This process might be expected to bring about an increased tolerance of the body to histamine. In view of these considerations the histamine skin reactions of a series of twenty hay-fever cases were measured before, during, and after a course of desensitizing injections of pollen extract. It was found that the reactions to histamine were not in any way diminished by the treatment, though the reactions to pollen extract progressively diminished. At first sight this result seems to discredit the histamine-tolerance theory, but when one considers the fact that histamine is believed to be an agent necessary for the physiological adjustment of the tone of the blood vessels, one could

not have hoped to find such a profound change of the blood vessels of the skin after desensitization with pollen extract as would have been entailed by a reduced skin reaction to histamine. The above result, therefore, does not in any way invalidate the histamine theory or lessen the probability that the histamine tolerance of the body as a whole may be increased.

One very interesting fact which sheds some light on the question from another angle, and which was first reported by Freeman[1] in 1930 and has been confirmed frequently since then at St. Mary's Hospital Asthma Clinic, is that a hay-fever patient who exhibits also a skin sensitivity to, say, egg or horse idiotoxin, on being thoroughly desensitized to pollen, has the skin reaction to egg or horse definitely reduced, but this regains its former intensity after a few weeks. Now, if a normal skin site is sensitized with serum containing idioceptors for both pollen and horse idiotoxins and desensitized to pollen by one injection of pollen extract, the site retains its full sensitivity to horse extract; also, the injection of pollen into a site sensitized to horse alone does not diminish its subsequent reaction to horse extract, nor does pollen extract have any desensitizing effect on the patient sensitive only to horse. The actual desensitization, therefore, is strictly specific, yet, as stated above, the repeated injection of pollen extract in a patient showing sensitivity to both pollen and horse leads to diminution of reaction to horse in addition to loss of reaction to pollen.

The only feasible explanation that presents itself to account for the non-specific action of a process which is apparently strictly specific, in view of the absence of any decrease of the reaction of the skin to histamine, is that the sensitized skin cells as the result of repeated trauma by one specific idiotoxin-idioceptor union in the cells develop a temporary increase of resistance to trauma of the same type produced by other specific idioceptor-idiotoxin unions. Thus, when the horse-pollen-sensitive patient is thoroughly desensitized with pollen extract and then tested with a quantity of horse extract equal to that used before the desensitization course, the skin cells, though still containing their full complement of horse idioceptor, suffer less damage by the horse idiotoxin-idioceptor union and liberate less histamine, causing the blood vessels to give a diminished skin reaction. This process might account also for the clinical improvement, frequently reported, produced by peptone and other forms of non-specific treatment in allergic cases.

Development and Nature of the Hypersensitive State

On this question there are but few facts available. One proven point is that sufferers from hay fever and other forms of allergic manifestation have very frequently a family history of allergy. The particular clinical condition is not necessarily inherited, the actual inheritance being the capacity to develop the hypersensitive state, and called "the allergic diathesis" for want of a more informative name. The exact nature of the immunological or biochemical kink which produces the actual sensitization in the individual with an allergic inheritance is so far unknown.

One point which may have a bearing on the matter has been reported (Harley[4]): the blood of non-sensitive persons readily lyse the "granules" of Timothy pollen, but the blood of hay-fever cases is deficient in this respect. As the method of preparation of the granule suspensions entailed the almost complete loss of idiotoxin, the meaning of this difference of lytic power is not obvious. Only one non-hay-fever patient in the series of twenty-four cases examined had blood deficient in this lytic power; skin tests to pollen were negative; there was no history of allergy in the antecedent family history or in that of the patient's husband, but the information was volunteered that her daughter suffered from hay fever. As the latter was not available for skin testing the "coincidence" loses much of its interest. On the other hand, that the capacity of a hay-fever patient's serum to sensitize a normal skin does not appear to be due directly to a deficiency or lack of any substance or property in that serum, but to an additional substance or property (the alleged idioceptor), is supported by the observation that the sensitizing power of such a serum is not in any way diminished by prolonged incubation at 37° C. when mixed with normal serum.

The ease and certainty with which hay-fever serum sensitizes a normal skin is in sharp contrast to the repeated failure of numerous workers to transfer the sensitive state to the lower animals by the injection of serum from the human hypersensitive. This led to testing the effect of rabbit serum on the sensitizing power of hay-fever serum. The latter was mixed with an equal volume of rabbit serum and incubated at 37° C. for one hour; a control mixture of hay-fever serum with normal saline was treated in a like manner. Equal volumes of both preparations were injected into two skin sites of a normal man. The following day 20,000 units of pollen extract were injected subcutaneously in the leg, and fifty minutes later a wheal with erythema developed at the site of the injection of the hay-fever-serum–saline mixture, but no change was observed at the site of the hay-fever-serum–rabbit-serum injection. This result was obtained in three normal persons. (The same subject was not suitable for repeat tests, as a condition of sensitivity to rabbit serum was liable to develop and obscure the results (Harley[5]).) As rabbit serum was found to be without effect on the idiotoxin of pollen extract, it appears that rabbit serum contains some factor capable of inhibiting or inactivating the hay-fever idioceptor. The nature and significance of this factor remain to be determined.

Diagnosis

The rhinorrhoea is coincident with the pollinating season of the grasses; in the average case of uncomplicated hay fever the symptoms begin about the third week in May and continue until the middle of July, the patient being free the remainder of the year. The symptoms consist of intense irritation and swelling of the mucous membrane of the nose, with paroxysms of violent sneezing (frequently as many as thirty to forty in rapid succession) accompanied by profuse serous discharge, which leaves the patient quite exhausted. There is also itching of the eyes with congestion of the conjunctivae and lachrymation. Asthmatic symptoms are not infrequently present, especially towards the end of the season, and these tend to increase in intensity and during each successive hay-fever season. The symptoms vary considerably with the weather and the locality; dry, sunny weather and proximity of pollinating grass increasing them, and rain and the still air in closed rooms, etc., tending to lessen them by decreasing the amount of pollen in the air. Grass pollen, being very light and borne by the air for great distances, makes it almost impossible for the sufferer to escape contact. As in other allergic conditions the immediate alleviation of symptoms produced by the injection of adrenaline is of diagnostic value.

SPECIFIC SKIN REACTIONS

The diagnosis is confirmed by producing a skin reaction with pollen extract. Freeman has shown that the idiotoxins of all the commonly occurring grasses are closely similar, and that Timothy pollen extract is the most

satisfactory for skin testing. The method of testing employed at the St. Mary's Hospital Hay Fever Clinic is the "prick" method (Freeman,[1] Harley[7]): a drop of pollen extract is placed on the skin of the forearm or leg and the latter lightly pricked with a hypodermic needle through the drop. The drop is then wiped off with cotton-wool. For routine testing two dilutions of pollen extract are used, 5,000 and 50,000 units per c.cm. respectively. If the patient is sensitive—that is, a true hay-fever sufferer—whealing and erythema develop about the site of the skin puncture in ten to fifteen minutes. This method has been found to be more convenient and exact than either the intradermal or the scratch method.

DIFFERENTIAL DIAGNOSIS

The characteristic type of symptoms, the periodicity, and the evidence of the skin tests usually make it easy to differentiate hay fever from the common cold, chronic infective nasal catarrh, and paroxysmal rhinorrhoea due to causes other than pollen.

Treatment

The most satisfactory treatment of hay fever is that of specific desensitization by a course of subcutaneous injections of Timothy pollen extract controlled by skin tests (Freeman,[1 2 3] Harley[7]). The doses are usually increased by 15 per cent. each time, and the amount of treatment required varies from case to case. If treatment is continued until the skin reactions and serum idioceptor are abolished complete relief of symptoms can be guaranteed. However, it is often found that satisfactory clinical results are obtained by a course of treatment shorter than that necessary to abolish completely the skin reactions. The injections are given most conveniently at intervals of two to three days during the months of April and May, but the rate of administration can be varied within wide limits. Freeman has perfected a method of "rush inoculation" by which the patient can receive the whole course of injections in less than a week, but careful and constant supervision by the medical man is necessary.

The next best method of treatment, should the patient present himself for treatment after the hay-fever season has started, is that of small daily doses of pollen extract combined with adrenaline. Many non-specific methods are often advocated, such as nasal ointments, sprays, douches, etc., and may give some relief in mild cases, especially those preparations containing adrenaline, but the effect is of short duration. As stated above the treatment of choice is specific desensitization with Timothy pollen extract, which gives practically 100 per cent. relief in all cases.

A word may be added, in conclusion, on the necessity of making skin tests for diagnosis and treatment. Last year a patient presented himself for treatment who was alleged to suffer from hay fever and who had received several courses of injections of pollen extract with no relief of symptoms; skin tests had not be made. The patient complained of attacks of sneezing, accompanied by nasal discharge, aggravated by dusty warm weather but occurring at intervals at all times of the year, and a general feeling of "stuffiness" of the nose between attacks. The history made one doubtful of the diagnosis, and skin tests with pollen extract were found to be negative. The condition was one of chronic nasal catarrh due to a streptococcus, with a hypersensitivity to the products of that organism, which explains the lack of improvement by injections of pollen extract. The condition cleared up with autogenous vaccine treatment.

My thanks are due to Dr. John Freeman, director of the Asthma Clinic, St. Mary's Hospital, for his advice and criticism.

REFERENCES

1 Freeman, J.: *Lancet*, 1930, i, 744.
2 Idem: Ibid., 1933, i, 573, 630.
3 Idem: *Practitioner*, November, 1933.
4 Harley, D.: *British Medical Journal*, 1933, i, 138.
5 Idem: *Lancet*, 1933, i, 690.
6 Idem: *Brit. Journ. Exper. Path.*, 1933, xiv, 171.
7 Idem: *Lancet*, 1933, ii, 1469.
8 Lewis, T.: *Heart*, 1924, xi, 119, 209.
9 Idem: Ibid., 1926, xiii, 219.
10 Idem: Ibid., 1927, xiv, 19.
11 Prausnitz, C., and Küstner, H.: *Zentralbl. f. Bakt.*, 1921, Abt. 1, lxxxvi, 160.

THE TREATMENT OF CEREBRO-SPINAL FEVER

BY

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Historical Survey of the Malady

Cerebro-spinal fever was first differentiated by Vieusseaux, in Geneva, in 1805. Danielson and Mason recorded an outbreak in Massachusetts in 1806, since when various manifestations of the disease have been recorded at intervals. In 1887 Weichselbaum gave a full description of the diplococci found in the direct smear of meningeal exudate observed post mortem in people who succumbed to meningitis. In 1896 Heubner was the first to demonstrate meningococci in cerebro-spinal fluid obtained from a living person. The most beneficial contribution was probably the discovery of anti-meningococcus serum by Jachmann in Germany and by Flexner in America, and the introduction of the intraspinal injection of the serum by Flexner in 1904.

Outbreaks of the disease were being recorded from nearly all parts of the world, with the result that towards the end of the nineteenth century cerebro-spinal fever had become—or at least was generally recognized as—a cosmopolitan disease. Except for two or three small epidemics recorded in London and Rochester, this country was comparatively free until the early part of the present century. The first serious outbreak in the British Isles occurred in Glasgow in 1907–8: there were 1,238 cases, with 838 deaths. About the same time the disease was prevalent in Belfast, where there were 725 cases.

The disease was made notifiable in 1912, and the following table shows the incidence since that year.

Year	Notified Cases	Registered Deaths
1912	104	142
1913	305	163
1914	315	194
1915	2,566	1,974
1916	1,306	1,214
1917	1,465	1,531
1918	798	812
1919	848	573
1920	583	412
1921	411	416
1922	344	360
1923	301	284
1924	397	301
1925	402	354
1926	385	365
1927	470	430
1928	412	438
1929	650	588
1930	664	638
1931	2,157	1,440
1932	2,695	1,199

The increased prevalence of the disease amongst the civilian population during the war years was a striking feature, and coincided with the outbreaks in the Army, where there were 4,238 cases, with 1,928 deaths, in the Home Commands from 1914 to 1918.

Epidemic Position

Thirty years ago it might fairly be said that cerebro-spinal fever was almost unknown in Great Britain, until in 1907–8 the malady appeared in epidemic form in Glasgow, Belfast, and Edinburgh.

The spread of infection of this disease cannot be explained on the basis of most other infectious diseases, as it differs considerably in several ways.

(*a*) The disease tends to remain localized in one particular district, and does not spread to the surrounding areas.

(*b*) The source of origin of the epidemic cannot be traced, as the disease starts suddenly in some area when the remainder of the country is free, and after about two years, more or less, suddenly stops and does not reappear again in that district.

(*c*) The disease is not highly infectious, as it is seldom that a second case appears in the same house.

Of 500 cases admitted into Lodge Moor Hospital there were only four instances where a second case had occurred in the same house: also, none of those in attendance in the hospital developed the malady. Again, Dicksen[1] records an outbreak of thirty cases of cerebro-spinal fever, with twenty-two deaths, at Ojuela, a compactly built and greatly overcrowded mining town of 5,000 inhabitants in Durango, Mexico, between March and July, 1929. The patients' ages ranged between 2 months and 40 years, and the disease was equally prevalent at all ages up to 25. In no instance did two cases occur in the same house or family, although isolation was impossible.

(*d*) The cases cannot be traced to have any relation to each other, as one case appears for the first time in one thickly crowded street or area, and the subsequent case from the other end of the district, in perhaps ideal surroundings, no common source or means of infection being traceable between the cases.

(*e*) For each case that was diagnosed in Sheffield, in the epidemic under review, the other members of the house were sent to the university laboratory, where a posterior nasal swab was taken, and any carriers found were isolated until free. It is interesting to note that none of these carriers developed the disease themselves, and in no instance could they be traced to be a source of infection to other cases.

Diagnosis

The disease presents no difficulty in those cases which show the classical signs of meningitis, such as headache, neck rigidity, and Kernig's sign, but it is in respect of those cases where the above signs are wanting that I wish to make a few remarks. I have found that, in most infants of about 1 year and under, a correct diagnosis can only be made after lumbar puncture. These cases merely showed the following features.

(*a*) A remittent type of temperature of about 102° F., for which no definite cause could be found.

(*b*) Irritability and resentfulness, which became more marked in routine examination.

(*c*) Complete absence of neck rigidity, head retraction, and Kernig's sign.

(*d*) Several cases showed a very heavy and dull appearance of the eyes, with slow gyrate movement of the eyeball, to which latter sign I attached some importance.

Speaking of the symptomatology of cerebro-spinal fever, Mogilincki[2] states:

"The onset in infants differs considerably from that in adults, in whom it is sudden and accompanied by shivering, vomiting, high fever from the first, headache, rigidity of the neck and limbs, and in most cases (60 to 70 per cent.) herpes labialis. In infants, on the other hand, it is rare to find an onset accompanied by convulsions, high fever, and vomiting, but the disease usually begins insidiously, without meningeal symptoms or herpes. In some cases there may be signs of respiratory disease, followed later by meningeal symptoms."

The fever seems to bear little or no relation to the severity of the symptoms, except immediately before death, when the temperature may reach hyperpyretic degrees—107° F. or over. The pulse appears to be as variable as the temperature when the patient is seen in the early days of the disease: it is usually soft, full, and slow. Often one sees a patient with a temperature of 102° and a pulse rate of 60. When the patient is restless and suffering much pain the pulse is usually small and rapid.

As regards the special symptoms—vomiting, headache, and rashes—about 98 per cent. of patients give a history of vomiting in the first day or so of the disease, but it is not seen much in hospital when they are under treatment. Most of my patients complained of severe frontal headache during the early days of their illness. The large purpuric type of rash resembles that seen in an acute pyaemic infection, and appears rapidly. The prognosis is very grave. The other type of haemorrhagic rash—the petechial variety—is not so likely to be fatal, and resembles the "rose spot" of typhoid fever or fresh flea-bites. Herpes usually appears around the mouth, but may occur in any part of the body, such as the hands, feet, legs, around the vulva, and the anus. The most characteristic point about the herpes is that it appears with unfailing regularity on the fourth day of disease, and also that the contents of the vesicle contain the meningococcus.

Lumbar Puncture as an Aid to Diagnosis

Too much stress cannot be laid on the value of lumbar puncture. I consider that it is a simple and harmless operation, and should be performed more often—especially during epidemics of cerebro-spinal fever—in those patients where the slightest suspicion arises. I have carried out over 1,500 lumbar punctures, and never have I seen any fatal results follow the operation.

Lumbar puncture is one of the most valuable aids and means at our disposal for arriving at a correct diagnosis. The macroscopic appearance of the cerebro-spinal fluid usually gives a fair idea of the type of meningitis. Should it be the least turbid, anti-meningococcal serum should be given forthwith, without waiting for a bacteriological report. On the other hand, a clear fluid does not eliminate cerebro-spinal fever, as the following case illustrates.

A female child, aged 3 years, was in a normal state of health, and quite playful, one Saturday afternoon. At 9 p.m. she was taken ill very suddenly, with vomiting, headache, restlessness, and irritability with mild delirium. The following morning she became unconscious, and numerous purpuric haemorrhages appeared on the skin. She was admitted into Lodge Moor Hospital about 3 p.m. on Sunday, and died at 8.30 p.m., death having taken place in less than twenty-four hours from the onset. Lumbar puncture was performed. The cerebro-spinal fluid was perfectly clear, and the pressure appeared normal. Only one polymorphonuclear cell was seen. Protein was 0.02 per cent., and direct examination of a film showed no organisms. A broth culture was examined after fifteen hours' growth, and was also negative, but after thirty-six hours' incubation at 37° C. was found positive, and a meningococcus, Group I, Type I, was isolated. At necropsy dilatation and congestion of the blood vessels over the surface of the brain were present, and on sectioning of the cerebral hemispheres numerous small pin-point striated haemorrhages were seen throughout the grey and white matter. The ventricles did not appear dilated, but the choroid plexuses were swollen and hyperaemic.

This type of case bears out the statement made by Herrick, that "no other infection so quickly slays."

Present Lines of Treatment

In the treatment of cerebro-spinal fever I think it is generally agreed that the best results have followed the introduction of anti-meningococcal serum. When Flexner

read his paper on the treatment of cerebro-spinal fever by the use of anti-meningococcal serum he gave the mortality rates in epidemics before serum was introduced or applied as follows: New York, 73 per cent.; Edinburgh, 80 per cent.; Glasgow, 74 per cent.; Belfast, 70 per cent.; France, 75 per cent.; Belgium, 77 per cent.; Palestine, 80 per cent.

He then showed a mortality of 30.9 per cent. on 1,294 cases treated with anti-meningococcal serum.

Robb[3] produced the following figures:

	Cases	Deaths	Mortality
			Per cent.
Cases treated without serum in Belfast Fever Hospitals, January to August 1907	275	199	72.3
Cases treated at home without serum, September to December, 1907	34	29	85.2
Cases treated with serum in Belfast Fever Hospitals, September to December, 1907	30	8	26.6

Ker[4] also reduced his death rate in Edinburgh, by the use of serum, from 80 to 37 per cent.

When Flexner introduced his serum he advised the following method in the treatment.

A daily lumbar puncture and intrathecal injection of 30 c.cm. of serum for at least three or four days, in adults, with a proportionately smaller injection, if thought advisable, in infants. In more severe cases he considered that larger doses of serum should be given at even shorter intervals, say, every twelve hours, and that this treatment should be continued for as many days as were necessary to clear the cerebro-spinal fluid and to alleviate the symptoms of meningitis.

Since the introduction of serum many observers have differed as to the best route for its administration.

Herrick, believing that the disease originates as a generalized meningococcus sepsis, endeavours to sterilize the blood stream by massive doses of anti-meningococcal serum given intravenously. Banks[5] states that it has been his practice to give large doses of multivalent serum—for example, an initial dose of 100 to 200 c.cm. intravenously—and to do repeated lumbar punctures at twenty-four-hour or forty-eight-hour intervals, with or without an initial intrathecal administration of serum.

Peters and Gunn[6] reported the results of 134 cases which occurred in Glasgow between January and the end of June, 1929, which were 112 deaths with only twenty-two recoveries, producing a death rate of 83.6 per cent. These cases were all treated in hospital with the use of serum, and Peters and Gunn pointed out that the mortality rate among cases in this outbreak (1929) was rather higher than that of the epidemic of 1906–8 by about 10 per cent. This seems to point to the absence of any degree of success attributed to improved methods of preparing and administering the specific antiserum. Experience in Glasgow does not confirm that of Flexner and others in America, where the case mortality is said to be halved by the use of serum.

Underwood[7] reports an outbreak of the malady in Rotherham between January and December, 1931, when sixty-nine cases were notified. Sixty of these were admitted to hospital, and in thirty-seven the diagnosis of cerebro-spinal fever was confirmed, and the death rate of these cases was 86 per cent.

Goldman and Bower[8] compare the results of forty-eight cases of cerebro-spinal fever treated by lumbar puncture plus injection of serum intrathecally, intravenously, and intramuscularly, with fifty cases treated by cisternal puncture plus the injection of serum intracisternally, intravenously, and intramuscularly. The forty-eight cases treated by the lumbar puncture method gave a mortality rate of 58.3 per cent. The average number of lumbar punctures performed in each case was 8.4. The average amount of serum given intrathecally was 200 c.cm., and 95 c.cm. either intravenously or intramuscularly. The total average amount was 295 c.cm. The fifty cases treated by the cisternal puncture produced a mortality rate of 36 per cent. The average number of cisternal punctures done per case was 6.4, the average amount of serum given intracisternally 135 c.cm., and 128 c.cm. either intravenously or intramuscularly, the total amount being 263 c.cm.

Ford, Shera, and Purves-Stewart[9] report a case of fulminating meningococcal meningitis with recovery following systematic cisternal punctures and polyvalent serum. In this case five lumbar punctures and five cisternal punctures were performed, 90 c.cm. of serum given intrathecally, and 82 c.cm. of serum intravenously—total amount of serum, 172 c.cm.

Josephine B. Neal[10] states, on the result of treatment of over 1,000 cases, that the Research Laboratory of the New York City Health Department advises the following method: "Intraspinal administration of serum is continued about every twenty-four hours, until at least two successive specimens of the fluid show no organisms by smear or culture. The dose of serum is usually 20 c.cm., if as much or more fluid has been obtained.

J. Cantacuzène[11] has published perhaps the best results ever known, and he has reduced his mortality rate as low as 4.8 per cent. In brief, serotherapy is administered as follows:

(*a*) Intraspinal inoculation as early as possible. (*b*) Daily inoculation of 25 to 35 c.cm., the operation being always preceded by microscopical examination of the cerebro-spinal fluid, which should serve as a guide. (*c*) Stop the inoculations as soon as the meningococci have disappeared and the purulent character of the fluid is changed, otherwise there is a danger of serous meningitis. (*d*) Inoculate the serum as closely as possible to the infected site, and in young children perform intraventricular injections through the fontanelle. (*e*) The intraspinal injections should be accompanied by intramuscular inoculations.

Personal Experience

During the years 1931-2-3, 369 cases of cerebro-spinal fever were admitted into Lodge Moor Hospital, Sheffield, of which 132 were fatal, giving a mortality rate of 33.06 per cent. Of these 132 deaths, fifty-two occurred within forty-eight hours of coming under treatment, which, when deducted, gives a mortality rate of 25.26 per cent. In 1931 there were eighty-five cases, with thirty-six deaths (42.35 per cent.). In 1932 there were 160 cases, with forty-nine deaths (30.62 per cent.). In 1933 there were 124 cases, with forty-seven deaths (37.9 per cent.).

The following table shows the age incidence and death rate amongst the 369 cases during the three years.

Age	Cases	Deaths	Death Rate
			Per cent.
Under 1 year	25	15	60
1 year and under 5 years	76	25	32.8
5 years and under 30 years	218	67	30.7
30 years and over	50	25	50
Total	369	132	33.06

During the year 1931 serum produced in Great Britain, France, and the United States of America was used, in the hope that we should find an efficient or active remedy, but it gave rather unsatisfactory and disappointing results. Towards the end of 1931 we were advised by Dr. E. L. Sturdee, of the Ministry of Health, to try a serum produced in London. We used this serum exclusively for

the treatment of our cases during the years 1931–2–3. By the results obtained during 1932–3 this serum would seem to have been very effective.

Of the 188 cases which recovered during 1932–3 by the use of this serum, I found that meningococci disappeared completely from the cerebro-spinal fluid after one intrathecal injection in ninety-eight cases, or 52.1 per cent., and that the meningococci disappeared in 148 cases, or 78.7 per cent., after having three consecutive intrathecal injections of serum. I believe that the presence or absence of the organism in the cerebro-spinal fluid is the only criterion by which we can form an opinion as to the value of the serum. I am inclined to agree with Dr. Cantacuzène that once the cerebro-spinal fluid has become sterile further intrathecal injections are dangerous, but it has been my practice to continue until the cerebro-spinal fluid has been found to be sterile on three consecutive days.

Out of the total of 132 deaths, the fifty-two occurring within forty-eight hours of admission to hospital were regarded as fulminating types of the disease. Of the remaining eighty deaths, it was found that in sixty-five instances (81.25 per cent.) the cerebro-spinal fluid remained persistently positive in spite of daily intrathecal injections of serum.

It is my opinion that the intrathecal method is the best, and gives the most satisfactory results. I used this method in all cases, and in those cases which showed signs of a septicaemia (by the appearance of purpuric or petechial haemorrhages) intravenous and intramuscular injections were used in addition.

We are informed that the cerebro-spinal fluid contains no complement, and thus no direct bactericidal action is likely to occur. The action of the serum is probably that of an increased phagocytosis. Physiologically, the lining membrane of the choroid plexus and the subarachnoid space is impermeable to substances passing from the blood to the cerebro-spinal fluid, except in the case of a few drugs. Serum injected intravenously must not reach the subarachnoid space, and, even if it does, must be in only very small and diluted quantities, and nothing like the amount which is brought into immediate and direct action by the intrathecal method.

I think that one can afford to neglect the clinical signs and symptoms that appear in the treatment of cerebro-spinal fever, and to attach the greatest importance to the condition of the fluid, as to whether meningococci are present or absent. Rigidity and irritability are increased by the intrathecal injection of serum, the following case being one of the many examples.

Case 175.—This boy was admitted on the second day of his illness. He was moderately conscious, and complained of severe headache. Neck rigidity and Kernig's sign were present. He was lumbar-punctured, and serum was given intrathecally. The following day the cerebro-spinal fluid was sterile, yet his clinical condition was apparently worse, as the rigidity was increased, with head retraction, and towards the same evening he had great difficulty in swallowing fluids. The following day he was so rigid and retracted that opisthotonos was present and he was unable to swallow anything. He was fed by an oesophageal tube. This condition became more marked each day, until lumbar puncture was stopped, and on the first day that this was omitted he was able to swallow a little fluid the same evening. The following day he enjoyed his full meals.

Some authorities advise cisternal puncture in the treatment of cerebro-spinal fever, but this method does not appear to me to have any advantage over the more simple lumbar puncture. It entails more risks, and should only be attempted by one skilled in the operation. By doing lumbar puncture one is able to drain the cerebro-spinal fluid very well and inject serum without any danger; the field of operation is quite safe, whereas in cisternal puncture the field of operation is exceedingly dangerous, and the injection of serum has to be done very cautiously. If one does not obtain cerebro-spinal fluid by lumbar puncture in patients suffering from cerebro-spinal fever, it is my experience that it will not be obtained by cisternal puncture, as the blockage usually occurs at the foramina of Luschka and Magendie, and has produced an internal hydrocephalus, so that the only thing that is of any value is ventricular puncture, which can be done quite easily in infants if the fontanelle is still patent.

The following table shows the average amount of serum used by the different routes, and the average number of lumbar and/or cisternal punctures performed by various authorities. The figures from Lodge Moor Hospital are included.

HERRICK:	
Average number of lumbar punctures	7
Average amount of serum given intravenously	400–600 c.cm.
Average amount of serum given intrathecally	100 ,,
Average total amount of serum given	650 ,,
BANKS:	
Average number of lumbar punctures	5
Average amount of serum given intravenously	255 c.cm.
Average amount of serum given intrathecally	45 ,,
Average total amount of serum given	300 ,,
GOLDMAN AND BOWER:	
Average number of lumbar punctures	8.4
Average amount of serum given intravenously	95 c.cm.
Average amount of serum given intrathecally	200 ,,
Average total amount of serum given	295 ,,
Average number of cisternal punctures	6.4
Average amount of serum given intracisternally	135 c.cm.
Average amount of serum given intravenously	128 ,,
Average total amount of serum given	263 ,,
FORD, SHERA, AND PURVES-STEWART:	
Average number of lumbar punctures 5, with average number of cisternal punctures 5	10
Average amount of serum given intrathecally	90 c.cm.
Average amount of serum given intravenously	82 ,,
Average total amount of serum given	172 ,,
LODGE MOOR HOSPITAL (1932–3):	
Average number of lumbar punctures	5.2
Average amount of serum given intrathecally	76.2 c.cm.
Average amount of serum given intravenously and intramuscularly	11.8 ,,
Average total amount of serum given	88 ,,

Choice of Anaesthetic

I prefer to do all lumbar punctures under a local anaesthetic, avoiding a general anaesthetic in all cases except those where a wildly delirious patient necessitates its use. In doing punctures under a local anaesthetic I give either morphine 1/3 grain or heroin 1/6 grain, according to the age of the patient, about a quarter of an hour beforehand, followed by 1 or 2 c.cm. of a 2 per cent. solution of novocain. With a general anaesthetic, when the patient is coming round he is exceedingly irritable, noisy, and very restless, and even the subsequent administration of morphine or heroin has very little effect.

Death occurring during the acute stage of cerebro-spinal fever is usually brought about by respiratory failure. I have seen numerous cases in which this condition occurred, and artificial respiration was carried out for several hours while the heart continued to beat regularly and forcibly. Under general anaesthesia respiratory failure is more liable to occur, and this is another reason in favour of a local anaesthetic. Another point of interest may be mentioned here. The meningococcus is not so delicate an organism as is generally believed. As a routine, about 5 c.cm. of cerebro-spinal fluid was collected from the patient by punctures and run into a similar quantity of glucose broth. This was incubated overnight, and the following morning a tube was forwarded to Dr. Scott (of the Ministry of Health) by ordinary post, in most instances arriving quite safely. From a broth culture I inoculated a blood agar

slope, which gave me a good growth. This was washed off with normal saline containing 0.5 per cent. phenol, and an emulsion obtained, which I put up against the four standard sera and the type of organism identified. The typing of the meningococcus during an epidemic is exceedingly valuable, as the particular type is always kept in view, and any change that may occur in the types is recognized and, if necessary, the serum altered.

Conclusion

During an epidemic of cerebro-spinal fever, when a patient complains of headache, and has some pain or tenderness on flexing the head—not necessarily neck rigidity—the examination of the cerebro-spinal fluid should be carried out without further delay. One cannot stress too much the great importance of lumbar puncture in infants where there are no definite signs or symptoms of meningeal irritation other than pyrexia, with fretfulness or irritability. I am convinced that a number of infants die during an epidemic when the disease is not even suspected.

During an epidemic serum should be prepared at once from the type of organism causing the disease, and freshly isolated strains of the infecting organism should be sent at regular and frequent intervals to the manufacturers of the serum. Once the disease is diagnosed, or when a turbid cerebro-spinal fluid is obtained, some anti-meningococcal serum should immediately be given intrathecally, without awaiting a bacteriological report on the fluid.

In treating the disease the condition of the cerebro-spinal fluid is very important, and as soon as it becomes sterile further punctures and injections of serum must be carefully considered. It has been my practice to obtain three consecutive sterile fluids before stopping the injections, though after I have obtained the first sterile fluid I reduce the quantity of serum. I believe that we do more harm than good by continued drainage of the cerebro-spinal fluid and intrathecal injection of serum. The examination of a direct smear is not sufficient evidence of persistent infection ; the fluid must be cultured before it can be said to be sterile. Frequently the rigidity is increased by the intrathecal injection of serum, and no great importance need be attached to this, provided that the cerebro-spinal fluid is sterile on culturing.

In conclusion, I do not claim that my results are any better than those of other workers, but I think I can safely state that the quantity of serum used and the number of lumbar punctures performed are much less, and that the number of days the patient is under active treatment has been reduced.

I am deeply indebted to the late Dr. Egerton Williams, medical superintendent, Lodge Moor Hospital, to Dr. Sturdee and Dr. Scott (Ministry of Health) for valuable suggestions ; and also to my friends and colleagues Dr. Mackenzie and Dr. Wilbourn, for their assistance in carrying out the treatment.

REFERENCES

[1] Dicksen, E. E.: *Journ. Amer. Med. Assoc.*, 1929.
[2] Mogilincki: *Arch. de Méd. des Enf.*, 1925.
[3] Robb, Gardner: *British Medical Journal*, 1908, i, 382.
[4] Ker: *Infectious Diseases.*
[5] Banks: *Lancet*, 1931.
[6] Peters and Gunn: *Journ. of Hyg.*, 1930.
[7] Underwood: *Lancet*, 1932.
[8] Goldman and Bower: *Amer. Journ. Med. Sci.*, 1931.
[9] Ford, Shera, and Purves-Stewart: *British Medical Journal*, 1932, i, 558.
[10] Neal, Josephine B.: *New York Journ. Med.*, 1930.
[11] Cantacuzène, J.: *Bull. Off. Internat. d'Hyg. Publique.*

According to M. Lasnet, the Director-General of Public Health in Algeria, owing to the systematic vaccination carried out in the urban and rural districts, only twenty-nine cases of small-pox occurred in Algeria during 1934. Five of these were in the province of Algiers, eighteen in that of Oran, two in that of Constantine, and four in the southern territories.

TWO CASES OF INJURY TO BLOOD VESSELS

BY

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HACKNEY HOSPITAL

The following two cases were under my care at the same time at Hackney Hospital, and they are worthy of reporting on account of some interesting points in their diagnosis and treatment. The injury in each case was the same—namely, the puncturing of an important blood vessel by a cutting instrument. The lesions produced were markedly dissimilar.

Case I—Injury to Femoral Artery

A Jewish tailor, aged 61, was admitted to Hackney Hospital on October 5th, 1933. Eighteen days before admission, while working at a bench, he ran a sharp-pointed scissors into the upper part of his left thigh. The wound was small, but bled briskly, so much so that he was admitted into another hospital, where he remained for two weeks. During that time the wound bled occasionally. On discharge he was able to walk with difficulty. When the wound was dressed at home by the district nurse there was sharp bleeding on three occasions, and his doctor sent him into Hackney Hospital.

On admission he complained of swelling and pain in his thigh. There was a large haematoma occupying Scarpa's triangle, and on its eminence a wound less than half an inch long, which discharged a little dark blood. The circulation in the lower extremity was good. After five days in hospital there was no diminution of the swelling, and there continued a very slight oozing from the wound. Then it was thought that a large vessel had been injured, most likely the femoral vein, and operation was considered necessary.

On October 12th, under general anaesthesia, a transverse incision was made across the most prominent part of the swelling. Reflexion of the skin showed a haematoma protruding from a hole about an inch long in the deep fascia. When this hole was enlarged the clot shot out of the wound, and was followed by a fountain of blood from the femoral artery. This was controlled immediately by digital pressure, and a ligature was passed round the femoral artery above and below the point of bleeding. The lesion was found to be a hole in the femoral artery to the outer side and below the origin of the profunda femoris branch. It was oval in shape, about half an inch long, and had rounded everted edges. The wound was closed with drainage.

At no time after operation did the circulation of the limb give any cause for anxiety. The patient made an uninterrupted recovery, his only trouble being stiffness of the knee, which was still present to some degree at the time of his discharge on December 6th.

The interesting feature in this case was the difficulty in diagnosing the seriousness of the injury. With a hole in the femoral artery one would expect more urgent symptoms, and even some interference with the circulation of the limb. Probably the hole made in the artery at the time of accident was small, becoming larger from the pressure and clot formation.

Case II—Injury to Deep Palmar Arch

A butcher, aged 25, was admitted to Hackney Hospital on November 23rd, 1933. While he was at work, three days before, a knife fell on him from the floor above and punctured his right hand. A painful swelling soon appeared in the hand.

On admission there was a small wound over the dorsum of the first interosseous space of the right hand, and a swelling about the size of a walnut filling up the first space. This swelling was painful and definitely pulsatile. The pulsation was lessened by occluding the radial artery, but it could be completely stopped only by occluding both the ulnar and the radial arteries. With both arteries occluded it was possible rapidly to empty the swelling by pressure. This seemed to indicate a free communica-

tion between the cavity of the swelling and the venous system. On the release of the arteries the swelling rapidly recurred by pulsations.

On November 28th the radial artery was ligated in front of the wrist. This caused only a temporary decrease in pulsation, which on the day after operation was as marked as before. Unfortunately at this stage the patient developed a tonsillitis, with general symptoms, and further operation was considered inadvisable until after his recovery. At the end of a fortnight the swelling was larger and the pulsatile impulse more marked. The swelling could still be emptied when the ulnar artery was compressed, to fill by pulsation immediately the artery was released.

On December 12th the ulnar artery was ligatured in front of the wrist. This stopped all pulsation for good, and at the time of his discharge, on December 20th, there remained only a small hard lump in the first interosseus space.

Evidently in this case the primary condition was a pulsating haematoma which communicated with a vein, forming a varicose aneurysm. Probably the vein was opened at the time of the accident. Although the aneurysm was at the radial end of the deep palmar arch, ligature of the radial was ineffective, and it was only after the ulnar artery also was ligatured that improvement took place.

In the second case the blood released into the hand showed no evidence of clotting, whereas in the first case clotting occurred to a degree sufficient even to control the flow from a large vessel like the femoral artery.

Summary

Two cases are reported of the results of puncture wounds of arteries. In the first, although there was a large hole in the femoral artery, the signs and symptoms produced were such that operative intervention was not considered necessary until over three weeks after the injury. In the second case a puncture wound of the hand caused a varicose aneurysm of the deep palmar arch, which was cured by ligature of the radial and ulnar arteries.

SODIUM EVIPAN ANAESTHESIA IN OPHTHALMIC SURGERY

WITH SPECIAL REFERENCE TO DISADVANTAGES

BY

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REGISTRAR, WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY

A history of medicine with special reference to therapeutic methods that have fallen into disuse would make a bulky volume. Some remedies are abandoned because the disadvantages of their use outweigh the advantages, some because the fashion has changed, some because they are superseded by better ; while some, like a promising child, doomed to an early death through over-care, receive too kindly treatment at the hands of their originators and proponents. It is not at all unlikely that a few quite valuable therapeutic agents have been lost to medicine by such an untimely demise. Tannic acid in the treatment of burns is an example of a procedure which was dead, and would still have been lost to the profession had not someone stumbled on its grave, exhumed, and resuscitated it.

Sodium amytal is a drug whose death certificate it would be interesting to see. Some five years ago it was being acclaimed as the ideal anaesthetic. It could be given intravenously in bed, obviating the mental torture of the journey to the operating theatre and of the anaesthetic induction. Sodium amytal had ceased to count in the realm of anaesthetics long before sodium evipan, its double first cousin (being related both on the sodium and barbiturate sides), came on the scene. Is evipan to go the same way as the other, either from too much attention and praise, or from some weakness which, to carry our metaphor one step further, may be of a hereditary or familial nature? My opinion is that there is some value in the drug, both as an anaesthetic and as a therapeutic agent, and that, unless its disadvantages are clearly set out, surgeons will soon cease to use it when they find it less satisfactory than the enthusiasts make it out to be.

The writing of this contribution is provoked by an article entitled " The Advantages of Intravenous (Evipan) Anaesthesia in Ophthalmic Surgery," by Lyle and Fenton,[1] in which " eighty-six cases are presented, showing very satisfactory results and no complications." As only one side of the subject is presented, it remains to complete it by showing the disadvantages attending this form of anaesthesia.

One must acknowledge the advantages, both general and special, give praise where praise is due, but qualify where qualification is necessary. Obvious advantages to the surgeon are the freedom of the patient's face from an anaesthetic mask, and the quick induction. The quick recovery is a distinct advantage for the nursing staff. From the patient's point of view a needle-prick is preferable to an anaesthetic mask, and the quick, easy oblivion is a blessing to a nervous person. If post-anaesthetic vomiting and discomfort are obviated we have perfection for the patient. The element of safety must be considered, of course. The disadvantages will be dealt with under the three headings " Undesirable Reflexes," " Post-operative Effects," and " The Problem of Safety."

Undesirable Reflexes

Of undesirable reflexes at the time of operation we have had sneezing, coughing, twitching or jerking, and resistance. Lyle and Fenton mention sneezing, but pass it over very lightly. When the patient sneezes, strong muscular contraction raises the head and trunk into a semi-sitting posture, from which the patient falls flaccidly and heavily back to the table unless someone is ready to support him till the next sneeze arrives. The sneeze is repeated several times, and after a wait of a minute or two the operation may usually proceed. The incident gives concern to surgeon, anaesthetist, and theatre staff ; especially so to the surgeon if the eye be one in which a sudden rise of tension is undesirable or dangerous—for example, in glaucoma, in elderly persons with arteriosclerosis, and in cases of ruptured globe. In spite of the report that evipan lowers the intraocular tension, a hearty sneeze must send it up to the limit of safety, or, in a diseased or injured eye, beyond the limit.

Coughing has much the same effect as sneezing, except that the muscular contraction is continuous, and keeps the patient in the semi-raised posture until the spasm is over. We have had four cases, in three of which the coughing was paroxysmal.

Muscular twitchings may be slight, or may amount to a lively jerking of the extremities (jactitation). "Muscular twitchings are another nuisance, both to anaesthetist and to surgeon, for they may either jerk the needle out of the vein or hinder the operative procedure. These movements are independent of stimuli, although they are accentuated and become vaguely purposive during skin incisions. Sedative premedication diminishes this trouble, however, and a further injection of a few [cubic] centimetres of evipan completely abolishes the movements."[2] Our experience accords fairly well with that of Slot and Galley

above, except in the matter of premedication, since our worst case of the sort was one that had had premedication (Case 6).

In two cases resistance was so active that ether was resorted to, and the amount required was little, if any, short of what would be required for ether anaesthesia without the evipan. In both cases the resistance was unexpected, since relaxation was early and the injection had exceeded the usual repetition of the full amount which had produced loss of consciousness. There is little doubt that a further injection would have secured complete anaesthesia, but one of the two cases had cardiac symptoms for several days following, either from the evipan or the ether, or the combination of the two (Case 5). In the other case the resistance was so determined and strong (one might almost say violent) that it is doubtful if further injection could have been accomplished (Case 7).

There is less likelihood of resistance if one waits about two minutes after the completion of the injection before inserting the eye speculum, but I doubt the advisability of leaving a needle in the vein for so long unless a little fluid is being run in. It would be quite a simple matter to have a second syringe filled with normal saline, and with this to keep the needle clear until the surgeon has waited the two minutes and then satisfied himself that the patient will not resist the speculum or the first grasping of the conjunctiva.

From Lyle and Fenton's report, and from our experience, it would seem necessary to be prepared to give more than one ampoule of 10 c.cm. of the solution in a few cases. The disadvantage of having to open and prepare another ampoule of solution would be overcome by having two sizes of ampoule, one size being sufficient to make, say, 12.5 c.cm. for use on patients who are likely to need the extra amount—that is, strong young adults of 12 st. or over.

Post-operative Effects

We have to report two cases of post-anaesthetic nausea and vomiting quite as depressing as after inhalation anaesthesia, but the vomitus was watery and frothy, and without visible coloration from bile. Chang reports two cases of vomiting.[3] Both had had food shortly before the injection. Our cases had had light meals two to three hours before operation. Other post-operative complications were sleeplessness, headache, and cardiac weakness, as shown by weak, rapid pulse and extrasystoles.

The Problem of Safety

Although there is a high therapeutic quotient shown by animal experiment, and we can infer that the margin of safety in human beings is a wide one, evidence is accumulating that the use of evipan is attended with as great risks as any other anaesthetic. Slot and Galley give case records of nine deaths, three from their own experience, only one of which occurred while under the anaesthetic, and six from an outside source. While it is quite possible that death might have occurred under any other anaesthetic in most of these cases, a perusal of these case records leads one to the conclusion that there is a very real risk, and one that cannot always be foreseen. Alarming symptoms are described in several cases that subsequently recovered. Advanced arteriosclerosis was a factor in one reported death.[4] An injection of 3 c.cm. was given to a patient with pulmonary tuberculosis and asthma. The injection was spread over six minutes, but breathing ceased, and was only restored after giving coramine 10 c.cm. intravenously and performing artificial respiration for some minutes.[5] Liver disease is a definite contraindication to the use of evipan.[6]

On the question of premedication there is contradictory evidence, both from the literature[7,8,9] and from our experience. The first case given below would seem to contraindicate the use of morphine, as far as one may draw conclusions from one case. In the remainder of our cases completely satisfactory results find a greater proportion among those who had no premedication, and the percentage of complications is greater in the cases that had preliminary sedation (see Tables I and II).

Case Reports

Case 1.—Female, aged 39, slight build, nervous, toxic, bad pyorrhoea alveolaris. Premedication—morphine and scopolamine. Operation—evisceration of the eyeball. Patient was drowsy on arrival in the theatre; only 2.5 c.cm. given; complete relaxation and perfect anaesthesia. Awake in twenty minutes. Up next day, but fainted twice, so was put back to bed. Examination revealed no organic disease. Sleepless for the next few nights.

Case 2.—Male, aged 53; pulmonary tuberculosis, unfit for chloroform or ether. No premedication. Operation—enucleation of eyeball. When 5 c.cm. evipan was given a fit of coughing dislodged the needle. Another 3 c.cm. was given; operation performed without inconvenience. On return to bed had frequent severe paroxysms of coughing, which caused deep cyanosis but did not waken him; heart only quickened by exertion. Awake in forty minutes. Complained of a taste of mutton fat, otherwise no discomfort.

Case 3.—Female, aged 61, well built. No premedication. Operation—enucleation. Stopped counting after 2 c.cm.; paroxysm of sneezing after 4 c.cm. Total injection, 7 c.cm. Pulse good throughout. Wakened forty minutes after injection and vomited clear, frothy fluid. Headache; vomiting at intervals through night and next day. At 10.30 p.m. the pulse rate was 96 with premature beats, which were noted again next day.

Case 4.—Male, aged 34, 12 st. in weight. Premedication—one allonal tablet. Operation—iridectomy and anterior chamber lavage. Evipan, 9 c.cm.; grasping of conjunctiva set up a paroxysm of sneezing; slight resistance during operation.

Case 5.—Female, aged 29, stout. Premedication—two tablets of allonal. Operation—enucleation. Lost consciousness very quickly; total, 7 c.cm. Very active resistance. Ether given by inhalation; required as much as ordinarily used. Next day pulse weak and rapid; coramine hypodermically. During the next few days had attacks of faintness with almost imperceptible pulse.

Case 6.—Male, aged 38, slight build. Premedication—two tablets of allonal one hour before operation (enucleation). Unconscious after 2.5 c.cm. evipan. After 6 c.cm. the head rose from the table about six inches, one slight cough was given, and the head fell back flaccidly. There was marked jactitation on commencing the operation. The remaining 4 c.cm. was injected while the arm gave occasional twitches. Operation completed without further difficulty.

Case 7.—Male, aged 47, medium build. Premedication—allonal, two tablets. Operation—enucleation. Unconscious when 3.5 c.cm. was given; total, 8 c.cm. Jaw dropped and body completely relaxed. On touching the eye patient had a paroxysm of coughing, followed by active resistance; struggled with arms and legs, and rolled head from side to side; impossible to give further injection. Ether.

Case 8.—Male, aged 20, slight build. Premedication—allonal, two tablets. Operation—enucleation. Unconscious when 6.5 c.cm. was injected; total, 8 c.cm. Perfect anaesthesia. Awake in fifteen minutes; no discomfort or after-effects.

TABLE I.—*Summary of Cases*

Operation	Premedication	No premedication	Total
Evisceration of globe ...	1	1	2
Enucleation of globe ...	8	3	11
Exploration of orbit ...	2	1	3
Iridectomy or abscission of prolapse	2	2	4
Dental extraction	—	2	2
Totals	13	9	22

Of the thirteen cases with premedication, seven (54 per cent.) had one or more unsatisfactory incidents or "complications." Of the nine with no premedication, three (33 per cent.) had complications.

TABLE II.—*Complications*

Complication	Premedication	No premedication	Total
Sneezing	1	1	2
Coughing	3	1	4
Muscular spasm	1	—	1
Resistance	2	1	3
Post-anaesthetic sickness	1	1	2
Cardiac symptoms	1	1	2
Total	9 (7 cases)	5 (3 cases)	

For details of technique and for general results the reader is referred to the report of 1,000 cases by Abel and Jarman.[8] There, too, he will find a warning against using ether or chloroform with evipan, the opinion that it is better not to use another barbiturate (which, of course, includes allonal) as a preparation for evipan, and a strong warning against using evipan single-handed. This report accords with their opinion. In their experience no patient who has had evipan alone has vomited, but against that we record one case where this incident did occur.

Conclusion

The chief concern of this article is with evipan in ophthalmic surgery, in which it has been shown to have some special disadvantages as well as advantages. In this particular branch of surgery the number and proportion of cases requiring a general anaesthetic are small. Carefully administered retrobulbar anaesthesia diminishes the number still more. In the small remainder, and subject to the same restrictions as in general surgery, evipan is entitled to consideration.

It is concluded that sodium evipan has a limited use in ophthalmic surgery, which use would be greater if its action were more certain.

I wish to thank Mr. G. F. Haycraft and Mr. H. Campbell Orr for permission to use evipan on their patients, and for their interest and co-operation.

REFERENCES

[1] Lyle, T. K., and Fenton, F. G.: *British Medical Journal*, 1934, ii, 589.
[2] Slot, G., and Galley, A. H.: Ibid., 1934, ii, 201.
[3] Chang, C.: *Chinese Med. Journ.*, 1934, xlviii, 577.
[4] Moerl, F.: International Abstract, *Surg., Gynecol. and Obstet.*, 1934, lviii, 71.
[5] Feldweg, P.: *Münch. med. Woch.*, 1934, 257; *Lancet*, 1934, i, 1300.
[6] Jarman, R., and Abel, A. L.: *Lancet*, 1933, ii, 18.
[7] Medical Research Council: Ibid., 1933, ii, 43.
[8] Jarman, R., and Abel, A. L.: Ibid., 1934, i, 510.
[9] Moncrieff, A.: *Proc. Roy. Soc. Med.*, 1934, xxvii, 5, 615.

J. H. Rabinovici (*Thèse de Paris*, 1935, No. 45), who records an illustrative case in a man aged 50, states that staphylococcal septicaemia may assume any form, from a fulminating attack which proves fatal in twenty-four hours, to a protracted illness which may last with remissions for years. The form with an acute onset is not necessarily fatal, but may take on a protracted course. Secondary localization in the bones or joints may occur at a later stage, and be from the first very extensive, with a tendency to necrosis without suppuration and to last for a considerable time. Treatment usually consists, according to the type of arthritis, in puncture, arthrotomy, or resection, but sometimes lesions of the joints and bones may be cured by immobilization alone.

EVIPAN IN OPHTHALMIC SURGERY

FURTHER EXPERIENCES

BY

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AND

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Since writing our article on the advantages of evipan in ophthalmic surgery (*British Medical Journal*, September 29th, 1934, p. 589), we have gained further experience in the use of this form of anaesthesia, and would like to emphasize the following points.

Over 200 operations have been performed under evipan anaesthesia at this hospital during the past twelve months, and our previous experience that evipan was an ideal anaesthetic for ophthalmic operations is definitely confirmed. We have not experienced any ophthalmic operation requiring general anaesthesia where evipan has not been far superior to any other general anaesthetic from all points of view, except perhaps for small casualty operations, where ethyl chloride or "gas" may be more convenient.

Happily, in our whole series of cases, we have not experienced the slightest anxiety at any time during the period of narcosis or subsequently. Independent observers have reported similar results. Dr. H. Klitzch, assistant surgeon to the Eye Clinic of the University of Halle, speaks very highly of evipan as an anaesthetic for ophthalmic operations in a paper based on his experience in over 100 cases.[1] Mr. Cashell, ophthalmic surgeon of Reading, reports that evipan is used as a routine anaesthetic in his work at the Royal Berkshire Hospital.

Practical Points

Several points of practical importance are worthy of mention.

1. *Premedication.*—We have recently introduced preoperative medication with omnopon and scopolamine injections in selected cases. This has proved very satisfactory. The amount of evipan required as compared with the amount where no premedication is given is materially reduced, and reflex movements of the patient, which sometimes occur with evipan alone, are diminished. This is of particular value in operations for squint in children, where, in an excitable child, with evipan alone, reflex twisting movements are sometimes troublesome, even with large dosage of the drug. With a preliminary injection of omnopon and scopolamine, this feature is usually abolished, the patient lying immobile, even with a materially reduced dosage. The "sneezing" reflex appears to be less liable to occur. Owing occasionally to mild post-anaesthetic vomiting where omnopon and scopolamine has been given in adults, it is perhaps advisable to omit this premedication where a cataract extraction under evipan is contemplated. As regards dosage, we have found that 1/3 grain of omnopon with 1/300 grain of scopolamine for patients over 12 years, and half that amount for children from 6 to 10 years, is satisfactory, given half to one hour before operation.

2. *Cataract Extractions.*—One cataract extraction was performed under evipan on an uncontrollable male patient in whom local anaesthesia, as indicated by a previous preliminary iridectomy, appeared inadvisable. No difficulties were encountered, and the patient was discharged with a satisfactory eye. Mr. Cashell of Reading reports that he has performed a successful cataract extraction under evipan at the Royal Berkshire Hospital.

[1] *Klinische Monats. f. Augenheilkunde*, May, 1934.

3. *Sneezing Reflex.*—This unusual phenomenon consists of a series of violent sneezes which sometimes occur in cases anaesthetized with evipan on manipulations of the conjunctiva. It appears to be initiated by painful stimulation of the fifth nerve endings in the conjunctiva, and is liable to cause trouble should a keratome or a Graefe knife be in the eyeball at the moment of sneezing. A thorough cocainization of the conjunctiva before operation generally abolishes this reflex in all cases except where the conjunctiva is intensely inflamed, as in acute glaucoma. It is always liable to occur in these latter cases, but appears less so with premedication.

4. *Effect on Raised Intraocular Tension.*—In our previous paper we noted that a fall under the influence of evipan of intraocular tension where this was raised, as in glaucoma, was an added advantage in this condition for operative purposes. We have carefully studied this reaction with every available case, taking tonometric readings of the intraocular tension immediately before and again a few minutes after the injection. In several cases we have noted a really dramatic fall of tension—as much as 40 mm. Hg within two minutes of the injection. In other cases there was a less marked but definite fall of the raised tension, and in very few cases was no improvement noted. We have tried it with more or less marked success as a therapeutic measure in the wards in several instances of acute glaucoma. In these cases after an injection of evipan the intraocular tension was generally lowered sufficiently to allow the eye to respond to eserine and heat, so that operation could be postponed to a more propitious moment. Although up to the present the number of cases of this type which have passed through our hands has been insufficient, and the results not constant enough, to warrant any dogmatic statements, we consider that not only has evipan special advantages as an anaesthetic in operations for acute glaucoma, but also that it has distinct possibilities as a therapeutic measure in the more conservative treatment of this condition.

Clinical Memoranda

Ether Convulsions with Normal Behaviour during Subsequent Ether Anaesthesia

The following case is considered worthy of record because it helps to disprove the suggestion that there is an "ether convulsion diathesis," or, as has been suggested by Kemp,[1] that "if an individual develops tetany during operation under ether anaesthesia the same individual will again develop tetany if he is re-operated on at a later date."

CASE RECORD

A girl, aged 3 years 8 months, was admitted to hospital on account of deformity and infection in the right foot and ankle region following an injury one month previously. The child had been treated at home, but five days before admission the foot had become worse and she was eventually sent to hospital. In the wards for two days conservative measures (dressings and splintage) were tried, but on the third day it was decided to put the leg in plaster as the child took her splints off.

Accordingly the child was anaesthetized with open ethyl chloride changing to ether. Induction was rather rapid and "pushed," and about five minutes from the commencement, when the child was deeply under, twitching of the eyelids and mouth was observed. The colour at that time was good and the respirations normal and quiet. The mask was immediately removed, but the twitching became more severe and widespread, involving the neck, arms, legs, and thorax. The child at this stage became cyanosed. Oxygen with 5 per cent. carbon dioxide was administered, and after another two minutes the convulsions passed off, leaving the child unconscious, and allowing sufficient relaxation for the plaster to be applied. Recovery from the anaesthetic was uneventful.

Forty-eight hours later the child was worse, and exploration of the os calcis was decided upon. The child was anaesthetized again, pure ether on an open mask being used throughout. The operation lasted at least half an hour, but there were no untoward anaesthetic complications. Subsequent progress was uneventful. On both occasions the child received a preliminary injection of 1/100 grain atropine.

The ether used at the first operation was analysed by Mr. Butchers, senior pharmacist to the Manchester Royal Infirmary, who reported that no impurities (aldehydes or peroxides) were found.

COMMENTARY

It is interesting to note that toxaemia was present throughout and was far more severe at the second operation. This may be contrasted with the late S. R. Wilson's case,[2] where an anaesthetic was given to reduce a compound fracture and no convulsions occurred; three days later amputation was performed for gas gangrene and the patient developed ether convulsions. It was suggested in this case that the added factor of toxaemia at the second administration may have precipitated the convulsions. In the case recorded the chief difference between the two administrations (if we except their duration) was that in the first instance the induction was pushed and the child was undoubtedly very deeply anaesthetized. Oxygen was not administered previous to the onset of the convulsions. This may be contrasted with the recent letter of Riddell, who is inclined to blame the admixture of oxygen with ether.[3]

The only other reported instance that I can find of a case of a subsequent administration of ether with safety to a patient who previously had had ether convulsions is that of Niel McDonald.[4]

My thanks are due to Mr. Butchers for his kindness in analysing the ether used at the first operation, and to Mr. Poole Wilson, assistant surgeon to the hospital, for permission to publish his case.

F. WILFRED WILLWAY, M.D., M.S., F.R.C.S.
Late Resident Surgical Officer, Royal Manchester Children's Hospital.

[1] Kemp, W. N.: Tetany during Ether Anaesthesia, *Brit. Journ. Anaesth.*, July, 1932 p. 169.

Surgical Emphysema Complicating Diphtheria with Pregnancy

It may be of interest to record the following somewhat unusual case.

A young woman, aged 19 years, was admitted into St. Mary's Hospital on December 19th, 1934, suffering from epilepsy. She was pregnant. On January 16th, 1935, she developed a sore throat, and a swab was taken. During the night of the 16th she commenced labour, and was transferred to the maternity block. On the morning of the 17th, when the os was fully dilated, she began to swell on the left side of the neck and face, with marked swelling of the eyelids. This gradually spread over the back of the neck and chest, extending downwards to below the breasts. On the back this swelling extended down to the twelfth dorsal vertebra. On pressure it was found to be definitely emphysematous. On the 17th the throat swab was reported positive to diphtheria. Owing to the critical state of the patient and the marked delay in delivery, it was necessary to apply forceps under a general anaesthetic. The emphysematous condition gradually cleared up in the course of a few days, and the patient has made an uninterrupted recovery. The diphtheria was very mild and uncomplicated. This is a very uncommon case, as, no doubt, the emphysematous condition was caused through the patient straining during labour. There was no tuberculous history.

I have to thank Dr. W. G. Willoughby for seeing the case for me.

Eastbourne. H. R. MCALEENAN, M.D., B.S.

[2] Wilson, S. R.: *Lancet*, May 28th, 1927, p. 1117.
[3] Riddell, L. A.: *British Medical Journal*, November 3rd, 1934, p. 834.
[4] *Proc. Roy. Soc. Med.*, Anaesthetic Section, May 4th, 1928.

Reviews

MIGRAINE

If importance may be claimed for a subject in proportion to the number of books it has provoked migraine certainly holds a high place in the record. The latest contribution—namely *Les Migraines*[1]—by Professor VALLERY-RADOT and J. HAMBURGER, includes a bibliography which contains more than seven hundred references, ranging from the beginning of medical history to the present day. This list is itself a feature of interest, but what will appeal to the ordinary reader is the text, for which the authors themselves are responsible; and the more so as this text is based not on books or theoretical studies, but on a wide personal experience in association with a considered judgement of the physiological and pathological issues which the subject involves. When we add, as we must do, that the discussion throughout is distinguished by a capacity to state an argument in clear and concise terms, and to present a conclusion which does not go in advance of the facts, our readers will gather that the book is a welcome and valuable contribution to the much-discussed question of migraine. What on this subject is certain, what is probable, and what is obscure—all alike receive here full and competent consideration.

In detail may be noted, first, that the authors insist on a definition which marks off migraine as distinct both from other forms of headache and also from organic changes which may, and sometimes do, produce hemicrania as one of their clinical consequences. Some failures in this respect by various writers have contributed to cause confusion in dealing with migraine as a classical clinical picture. Here, on the contrary, the definition is clear-cut and decisive, and is applied consistently through all the chapters.

On the immediate phenomena the authors allow, what indeed is generally conceded, that when visual disturbances are features of the migrainous attack these must be referred to intracranial arterial spasm; but they cannot agree that the hemicrania, vomiting, and other symptoms can be explained in this fashion, and after a critical examination of many hypotheses they conclude that on this issue no confident explanation can at present be advanced. Another feature of the book is a careful analysis of the various agencies which are believed, more or less generally, to establish a liability to migraine; and an estimate of the constitutional states, as distinct from the local conditions, which immediately precede or accompany the attack. The chapters in this section include a survey of observations reported on changes in the blood, urine, cerebro-spinal fluid, blood pressure, and endocrine secretions; a review of the influence of heredity, diet, anaphylaxis, and biliary and gastro-intestinal disturbances; and an inquiry directed to the possible relation of migraine to other diseases, as epilepsy, asthma, urticaria, rheumatism, and gout. If some conventional doctrines are brought under the shadow of doubt, no adverse conclusion is presented without due reason and argument.

From these brief statements may be gathered an appreciation of the completeness and comprehensiveness of the discussion. Moreover, the various academic questions presented are not left in the air. On the contrary, they are made the basis for therapeutic measures, both preventive and curative. The claim is advanced that by a careful study of the patient—history, symptoms, clinical examination—many cases can be placed in a definite aetiological group, with a corresponding indication for appropriate therapeutic measures. Yet it is allowed that however accurate and thorough the survey, there remain instances in which the causation is uncertain or obscure. For both the one and the other provision has to be made, and this is attempted in chapters on treatment which leave nothing to be desired. Hence, whether judged by a standard of interest or of service *Les Migraines* merits a very grateful reception and recognition.

[1] *Les Migraines. Étude Pathogenique Clinique et Thérapeutique.* By Pasteur Vallery-Radot and Jean Hamburger. Paris: Masson et Cie. 1935. (Pp. 232; 4 figures. 45 fr.)

GROWTH AND MENTAL FUNCTION

Two subjects, or aspects of subjects, which have been relatively neglected in the education of the medical student are growth and psychology. Normal mentality and behaviour, and the ways in which they are modified in illness, have not received the attention they deserve in comparison with structural or functional bodily conditions or disturbance; and in the study of anatomy and physiology teaching is directed predominantly to the adult human being. A book which will materially help towards the correction of both these defects is *Developmental Psychology*,[2] by Dr. FLORENCE L. GOODENOUGH, professor at the Institute of Child Welfare, University of Minnesota. As a textbook of psychology which may be used to advantage either by the medical student and practitioner or by the interested lay person, it is constructed upon a new plan. For the student, whether of medicine, mental science, or pedagogy, it is an admirable introduction to the sequential study and understanding of human behaviour. "Psychology," writes the author, "as it is taken up in this book, is especially concerned with finding out the reasons for human action." And again, it is "largely concerned with the study of the processes by which early potentialities interact with later experience to form new patterns of behaviour, new ways of doing things."

In pursuance of the method thus indicated, Dr. Goodenough first deals with the hereditary background and its physical basis, then with pre-natal conditions and the behaviour of the newborn child, then with the growth and functions of sense organs, then with the period before speech and the acquisition of that accomplishment. So the emotional behaviour and social reactions of infancy and early childhood are considered, and this is followed by excellent chapters on general intelligence and its measurement, on the methods of learning both in younger and in older children, on special abilities and defects, and on personality and character. Later, the periods of adolescence, maturity, and old age are dealt with in similar fashion. In their appropriate places in this sequence both mental defect and mental disease receive a brief and general exposition, and a large number of particular subjects, such as colour vision, conditioned reflexes, and vocational guidance, are adequately considered.

The book is singularly complete in the ground which it covers, sustained in its interest, consistent in its method and point of view. It is good throughout, though, naturally, all of it is not of equal excellence, and the latter portion is perhaps unduly dominated by the American reliance on the statistical results of miscellaneous group investigations. This developmental approach to the study of psychology is obviously of great value: it is educationally attractive and illuminating to deal with the stages of human behaviour successively and to relate them to one another, and to gather in this way certain generalizations and principles which must be of great help, both to medical practitioner and to teacher in their practical application to further professional studies and to every-

[2] *Developmental Psychology. An Introduction to the Study of Human Behaviour.* By Florence L. Goodenough. London and New York: D. Appleton-Century Company Inc. 1934. (Pp. 619; 81 figures. 12s. 6d. net.)

day work. The volume may well become an established textbook when medical studies are reformed in the respects indicated at the beginning of this review, and meanwhile it may be read with profit by the present generation of medical students, even though they may be conscious that no examinational test will necessarily follow.

POISONING BY EXHAUST GASES

"Mechanical Transport and Public Health,"[3] by Professor M. SCHMIDTMANN, is a monograph dealing with the nature of poisoning by exhaust gases. The author exposed rabbits to the exhaust gases of a petrol motor for various periods, and also studied the effects produced by benzene vapour. He concluded that the concentrations of exhaust gases occurring in busy streets were below the concentration needed to produce demonstrable toxic effects, but he also found that higher concentrations of these gases, in addition to the effects produced by carbon monoxide, also produced in rabbits certain characteristic actions. The two chief effects observed were, first, injury to the haematopoietic organs and consequent leucopenia, and, secondly, changes in the bronchi, the chief of which were contraction of the bronchial muscles and folding of the epithelium. The author found no signs of malignant growth—a point of interest, since there is a widespread belief that there has been an increase in the frequency of bronchial carcinoma which has coincided with the increase in motor transport.

DENTAL ASPECTS OF BACTERIAL INFECTION

We are not surprised that a second edition of Mr. J. L. T. APPLETON'S work on *Bacterial Infection with Special Reference to Dental Practice*[4] has been called for. As professor of microbiology and bacteriology in the Thomas W. Evans Museum and Dental Institute School of Dentistry in the University of Pennsylvania, he enjoys almost unrivalled opportunities for correlating the clinical, laboratory, and book sides of his subjects, and he has made full use of his good fortune. The book has been almost completely revised. "Every word has been weighed. . . . Unfortunately, one might say, much has been added"—we think the chapter (a new one) on oral manifestations of extra-oral infections sufficiently answers the author's doubts. The scope ranges from the general to the particular—from the morphology and classification of bacteria, the action of antiseptics, conditions of attack and defence through general hygiene, oral hygiene, to special infections of the oral cavity. The note on "standard tests for antibacterial effect of chemicals" (pp. 58, 59, and 60) is a good example of the laboratory professor at his best: the author endorses the opinion of Bancroft and Richter as to the importance of using animals in determining the efficiency of "antiseptics" and "disinfectants." The cautious clinician appears in the discussion on the removal of tonsils and adenoids (pp. 147 and 148): the author cites authority on both sides, but gives no casting vote.

The chapter on the "clinical status of the pulpless tooth" shows well the combination of the clinician and the laboratory professor. The *x* rays are useful only in *locating* pulpless teeth; the author agrees with Rosenow that "the roentgen-ray-negative tooth may harbour streptococci that have a higher degree of specific invasive power than those isolated from pulpless teeth in which marked rarefaction is apparent," and goes so far as to cast doubts on the generally accepted idea that regeneration of bone (for example, after apicectomy) indicates sterility of the peri-apical tissues. He concludes the discussion thus: "The factors determining the establishment in some cases of a secondary lesion by bacteria (or their products) escaping from the peri-apical tissues are unknown. Likewise we have no established basis by which one can decide whether a particular pulpless tooth is actually or potentially a source of danger."

The concluding chapter, on syphilis, is one of the most useful items of the book. Throughout its pages the author quotes very extensively the work and opinion of others, and in each case gives exact reference; indeed, we doubt whether any single paper or book bearing on his subject has escaped his scrutiny.

"DOUBLE DISSECTION"

D. J. MORTON'S *Human Anatomy: Double Dissection Method*[5] represents a departure from the older type of dissecting manual. It is designed to meet the restrictions which are made on the time available for the study of anatomy owing to increased time required for the later stages of the medical curriculum. This change amounts in some of the American colleges to a reduction of the former two years' course of anatomy to one year, which naturally tends to lower the high standard of anatomical proficiency which has formerly been attained. The author attempts to counteract this tendency by remodelling the method of presenting the subject-matter and by a modified method of dissection. Two dissections of the entire body are made, the first being restricted to the larger structures and visceral organs, and the second applying chiefly to the vascular and nervous systems, with a review of the larger structures. The students work in pairs, and co-ordination is maintained between lectures and laboratory work.

The book consists of two volumes, the first of which serves as a guide to the dissection of the muscles and a topographical inspection of the viscera. The second is a schematic guide to more detailed dissections, including the vessels and nerves and special regions such as the orbit and the nasal cavities. Each volume provides spaces and blank pages for drawings and systematized notes, and also outline figures, which it is intended should be completed by the student with the names of the parts indicated in the diagram filled in. The dissections are well planned, and their description should prove a useful guide to the practical work. In some instances, however, the directions are not sufficiently explicit to be followed by a student without previous knowledge, and he would require supplementary information from a demonstrator, dissecting manual, or atlas. The illustrations as a whole are clear, and admirably serve the purpose for which they are intended. The few defects we have noted are mostly unimportant. They include: incorrect spelling of a considerable number of words; too schematic, and thus inaccurate, drawing of one or two of the figures—for example, those on pages 466 and 492, vol. ii; and the description of the intercostal vessels and nerves as being situated between the internal and external intercostal muscles, whereas it has recently been shown that they lie deep to the internal intercostal muscles, between these and the musculo-fascial plane consisting of the intracostal and subcostal musculature.

The advantages claimed for the "double dissection method" are, in our opinion, doubtful. The method

[3] *Kraftverkehr und Volksgesundheit.* By M. Schmidtmann. Jena: G. Fischer. 1934. (Pp. 44; illustrated. RM. 4.50.)

[4] *Bacterial Infection. With Special Reference to Dental Practice.* By J. L. T. Appleton, Jun., B.S., D.D.S. Second edition, thoroughly revised. London: H. Kimpton. 1934. (Pp. 654; 122 figures, 4 coloured plates. 32s. net.)

[5] *Human Anatomy: Double Dissection Method.* Two volumes. *First and Second Dissection.* By Dudley J. Morton. New York: Columbia University Press; London: H. Milford, Oxford University Press. 1934. (Pp. 550; illustrated. 30s. net.)

entails the use of double the amount of material, and is thus in many ways much more costly than the methods now in vogue. It also, if carried out satisfactorily, involves a greater expenditure of the time of both teacher and student, and necessitates a considerable amount of repetition. We believe that one complete dissection of the body carefully carried out is better than any number hastily undertaken without due attention to detail. Nevertheless, the book may be recommended as a valuable supplementary guide to dissection and note-taking, whether the "double dissection method" is, or is not, adopted in the particular college at which the student is studying.

Notes on Books

In this comprehensive work, dealing with all kinds of *Methods of Treatment*,[6] Professor LOGAN CLENDENING has had the assistance of eleven contributors in special branches. This arrangement has been so successful that five editions have been required since its first appearance in 1924. The book is divided into two parts—the first being devoted to general therapeutics, such as diet, methods of administration of drugs, hydrotherapy, medical gymnastics, radiotherapy, climatology, and physiotherapy; the remaining part describes the special treatment of various diseases. The first chapter begins with the modest, if broad-minded, statement that "rest and surgery are the most effective therapeutic methods the modern physician has to offer to a patient." Some may think this an understatement. On the other hand, it is rather an exaggeration to say that "Clifford Allbutt devoted two large volumes to the attempted demonstration that angina is due to disease of the aorta," for though the title "Diseases of Arteries including Angina Pectoris" might support this, examination of the text would show that the whole of one volume and part of the other deal with arteriosclerosis. *Methods of Treatment* is written in an attractive manner, with many illustrative cases and quotations; for example, in the practical account of purgatives, of which elsewhere the author graphically remarks that by their use in acute abdominal pain not only is the principle of rest violated but it "is the principal way doctors kill patients."

Written in a popular style for the lay public, and dedicated by Dr. HOWARD HAGGARD, associate professor of applied physiology in the University of Yale, to his three children, *The Doctor in History*[7] contains much that is interesting, bizarre, and dramatic. This is the third book of the kind written by the author, who has a wide and curious knowledge of medicine, and a talent for its graphic presentment. Beginning with an impressive, if short, paragraph of five words—"Disease is older than man"—he describes some diseases of the dinosaurs, mentions that sabre-toothed tigers had toothache, and then takes the reader, by stages, over two hundred centuries up to the present day, when, in the enthusiasm for the social benefits of medical leadership, the doctor at the bedside is said to be out of sight and mind.

The total number of names in the *Dentists Register*[8] for 1935 is 14,439, being 14 more than the figure for the preceding year. Of these, 7,586 (52.54 per cent.) are registered with medical, surgical, or dental qualifications, as compared with 7,373 in 1934. None of the 280 persons newly registered are without qualifications. Death and other causes were concerned in the removal of 509 names, while 236 which had been omitted from previous editions for various reasons now reappear.

[6] *Methods of Treatment*. By Logan Clendening, M.D. Fifth edition. London: Henry Kimpton. 1935. (Pp. 879; 103 figures. 42s. net.)

[7] *The Doctor in History*. By Howard W. Haggard. New Haven: Yale University Press; London: Humphrey Milford, Oxford University Press. 1934. (Pp. xiii + 408; 115 figures. 17s. net.)

[8] Published for the Dental Board of the United Kingdom by Constable and Co., Ltd., 10, Orange Street, W.C.2. Price 12s. (post free 12s. 6d.)

Preparations and Appliances

AIRWAY FOR INTRANASAL OPERATIONS

Sir FRANCIS SHIPWAY writes: A simple method of preventing blood, pus, or other fluid from entering the trachea during intranasal operations has been devised and proved during prolonged trial to be effective. An airway carries a rubber balloon, with tube for its inflation; it is lubricated before insertion, and when *in situ* the balloon is distended and the

tube clipped. Ribbon-gauze is then packed in the mouth. Nitrous oxide and oxygen, etc., can be administered through it by means of the special fitting (illustrated), which does not interfere with the manipulations of the surgeon.

I am indebted to Mr. W. M. Mollison for his co-operation and suggestions. The airway is made in three sizes, and supplied by Messrs. A. Charles King, Ltd., 34, Devonshire Street, W.1.

LOBECTOMY CLAMP

Mr. W. H. C. ROMANIS, F.R.C.S., and Mr. T. H. SELLORS, F.R.C.S., send the following description of a lobectomy clamp which they have devised.

This new clamp has been designed for holding and crushing the bronchus and pedicle of the lobe during the operation of lobectomy. The ordinary snare occasionally comes off the pedicle at the critical moment, but this clamp will give a

firm hold, and not slip, as it has great crushing power, while the longitudinal serrations of the blades render it possible to cut the lobe away absolutely flush with the clamp with safety. The upturned end renders the tying of ligatures or stitches round the pedicle easy. The clamp is made in two sizes, for adults or children. It is manufactured by the Medical Supply Association Ltd., 95, Wimpole Street, W.1.

GRAPE JUICE

"Fruydor" is a preparation of grape juice, marketed by Messrs. Courtin and Warner Ltd. (Worcester Street, Southwark Street, S.E.). The juice is conserved by means of Dr. Matzka's process. It is stated that this avoids the use of either preservatives or pasteurization and does not reduce the vitamin content of the grape juice. Fruydor makes a very pleasant drink.

NOTIFIABLE INFECTIOUS DISEASES IN GERMANY DURING THE LAST FIVE YEARS

[FROM A MEDICAL CORRESPONDENT IN BERLIN]

SCARLET FEVER AND DIPHTHERIA

During recent years scarlet fever and diphtheria have again taken a leading part among the infectious diseases of childhood. Both diseases are notifiable; notification should be effected by the practitioner within twenty-four hours in a prescribed form, and data so obtained, which go back many years, are reasonably homogeneous, although naturally mild cases may occasionally escape notification. Recent epidemic movements in Germany have been similar to those in England and Wales.

Cases and Deaths in the German Reich for Scarlet Fever and Diphtheria from 1930 to 1934[1]

Year	Scarlet Fever			Diphtheria		
	Cases	Deaths	Fatality	Cases	Deaths	Fatality
			Per cent.			Per cent.
1930	70,508	720	1.02	69,179	4,282	6.19
1931	46,930	471	1.00	56,627	3,095	5.47
1932	55,268	397	0.72	64,138	2,974	4.64
1933	76,749	546	0.71	74,559	3,628	4.87
1934	110,706[2]	789[2]	0.71	113,936[2]	4,799[2]	4.21

[1] *Sanitätspolizeiliche Meldungen nach Reichsgesundheitsblatt*, 1935, Nr. 4. [2] Provisional figures.

It will be seen that the movements of scarlet fever and diphtheria have been similar. A minimum was reached in 1931 (following a transitory increase in 1930), followed by a considerable increase until in the last complete year, 1934, the 100,000 mark was exceeded for the first time since many years. It will be noticed that deaths have not increased *pari passu*, so that the fatality rate has tended to fall—for example, from 1.02 per cent. in 1930 for scarlet fever to 0.71 per cent. in 1934, from 6.19 per cent. for diphtheria to 4.21 per cent. The basal figures are so large that these differences must be regarded as statistically significant. The mildness of scarlet fever in comparison with diphtheria is noteworthy; in fact, taking the notifications as a basis, one has 1 death in 100 or even, in the last year, 1 in 140 cases, while we still have a death for every twenty or twenty-five cases of diphtheria. If we base our conclusions on the statistics of deaths, based on death certificates, the fatality of diphtheria is higher still. Thus for 1932 the notification data give 2,974 fatal cases of diphtheria, but the *Reichstodesursachenstatistik* assigns 3,992 deaths to this cause (classified by age and sex). In all years the differences are considerable. It would appear that a number of fatal cases escape weekly notification, and are only brought into the statistics as a result of scrutinizing the death certificates. As equally some of the cases—namely, very mild cases—escape notification, in practice one must content oneself with the notification returns of cases and deaths. We must, however, remember that "notified" cases and actual cases are not identical.

ENGLISH EXPERIENCE COMPARED

A comparison with the experience of England and Wales is of interest.

Cases and Deaths in England and Wales for Scarlet Fever and Diphtheria from 1930 to 1934

Year.	Scarlet Fever			Diphtheria		
	Cases	Deaths	Fatality	Cases	Deaths	Fatality
			Per cent.			Per cent.
1930	111,077	740	0.67	73,953	3,497	4.73
1931	81,569	540	0.66	50,236	2,673	5.32
1932	85,054	530	0.62	43,399	2,339	5.39
1933	129,528	729	0 56	47,435	2,646	5.58
1934	152,060	923*	0.61	68,758	4,018*	5.48

* Provisional figures for deaths.

We notice in the peak of 1930 (especially for diphtheria), the decline in the following years, and the considerable increase beginning in 1933 a similarity to the German experience, but also some striking differences. Thus the frequency of scarlet fever has been much greater than that of diphtheria—even the absolute numbers for the former are greater—so that, related to population, remembering that the population of England and Wales is approximately 40 millions, that of the German Reich 65 millions, the difference is large. It might be matter for investigation whether the more rapid decline in the proportion of children in the German population is a factor. Since scarlet fever produces a higher measure of immunity than diphtheria, one would expect a more striking periodicity—as we see in measles with its very high degree of immunity after attack most clearly. The fatality of scarlet fever in England and Wales has been very low, and even tending to decrease. Whether better notification of mild and almost afebrile cases is a partial explanation cannot be determined statistically. More worthy of attention is the fact that the fatality of diphtheria has not followed the same course as in Germany. While in Germany, as we have seen, the fatality has declined, in England and Wales there has been a tendency for it to increase. Considering the size of the experience, the change from 4.73 per cent. in 1930 to 5.84 per cent. in 1934 can hardly be attributed to chance factors; the significance must, however, be judged on clinical material, which although less extensive is naturally more impressive.

MEASLES, RUBELLA, AND WHOOPING-COUGH

A few observations respecting measles and whooping-cough in Germany may be permitted. Since, as in England and Wales, these diseases are not notifiable, conclusions can only be based on mortality figures, which cannot be quite so recent. These infections are more serious causes of mortality than scarlet fever and of the same order of magnitude as diphtheria.

Deaths from Measles and Whooping-cough in the German Reich from 1930 to 1932 (according to Official Classification of Causes of Death)

Year	Measles and German Measles		Whooping-cough	
	Male	Female	Male	Female
1930	1,602	1,377	1,717	1,886
1931	659	622	1,083	1,2.8
1932	783	742	1,212	1,310

There is a considerable difference in the age distributions of the contrasted infections. Scarlet fever and diphtheria claim most of their victims at school age, while measles and whooping-cough are almost exclusively fatal infections of pre-school life. Thus of the 1,525 deaths from measles in 1932, 1,347 were at ages 0–5 years, of 2,522 deaths from whooping-cough as many as 2,472. Indeed, could the age of infection be postponed, a very large proportion of lives would be saved, since, as is well known, deaths of young children are mostly due to pulmonary or bronchopneumonic complications.

The data have been shown by sexes to bring out another phenomenon of international character—namely, the greater incidence of fatal whooping-cough upon females. This matter was examined in detail recently by Dr. Bradford Hill (*Journ. Roy. Stat. Soc.*, 1933, xcvi, p. 240) using the English data. It constitutes an exception to the general rule of infectious diseases, although sometimes the data of scarlet fever exhibit a slight tendency towards excess mortality for females.

The Tsinan Ophthalmological Society was organized in January, 1935, and its first meeting was held at Cheeloo University School of Medicine, Tsinan, Shantung, China, on January 30th. There was a large attendance. The two medical schools in this city as well as the various hospitals were well represented. Dr. Eugene Chan, head of the Department of Ophthalmology at Cheeloo, acted as the chairman.

HUGHLINGS JACKSON CENTENARY

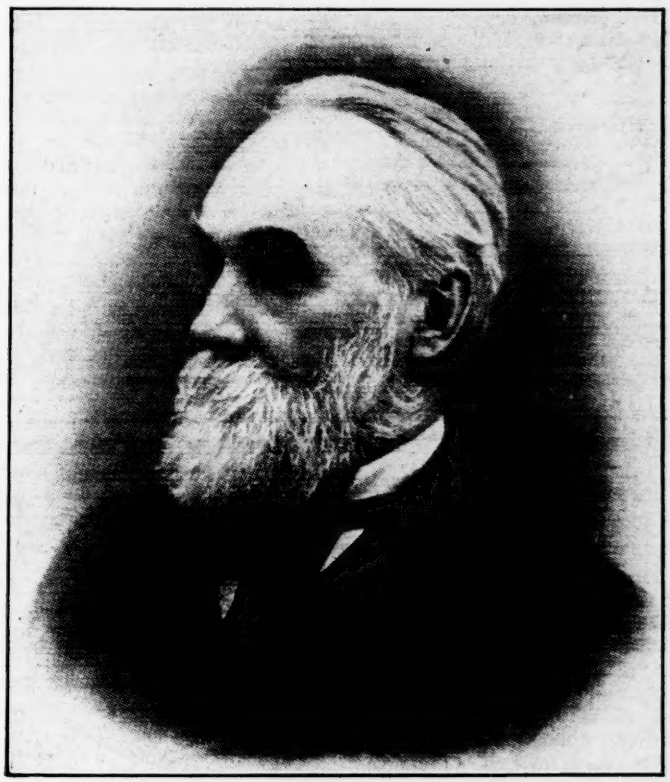
A COMMEMORATIVE DINNER

On April 4th, 1835, Hughlings Jackson was born in the village of Green Hammerton, Yorkshire, and a hundred years later on the same day a company of neurologists, including several who had known him personally and had been his disciples, assembled in London to do honour to his memory. The commemorative dinner was organized by the Section of Neurology of the Royal Society of Medicine, and the guests included two original members of the Neurological Society of London, of which Jackson was first president—namely Sir Thomas Barlow and Sir William Hale-White.

THE PRESIDENT'S SPEECH

Dr. S. A. Kinnier Wilson, who presided, spoke in a spirit of delightful reminiscence of his friendship with Jackson for "a few precious years." When he, a young student, went to Queen Square at the end of 1904, Jackson was already on the threshold of seventy, and though he came to the hospital frequently he never stayed long.

"I loved Dr. Jackson, and more or less attached myself to him. I saw more of him than anyone of my generation, and I yielded to none in my appreciation and affection. It is difficult to say exactly what it was in Jackson that made the appeal. Partly, no doubt, seniority, which I had been brought up to respect. But it was his philosophic theorizing that fascinated one. I never knew him in his heyday, but even in age the stimulus of his mind was deeply felt."



Dr. Kinnier Wilson said that he made a practice of writing down Jackson's conversations — the only man he had ever Boswellized. He was accustomed to go on drives with him in his carriage and pair, when Jackson would utter remarks of penetrating insight or playful humour, and, returning, the young disciple would commit them to paper. He gave some interesting extracts from these casual memoirs. Some of them touched on Jackson's interest in speech defects. He mentioned that Emerson was aphasic before he died, and called for "the thing with four legs," having lost the word "table." Spoonerisms (which, according to another speaker, Jackson attributed to "hurry of the right hemisphere") especially interested him. He pointed out that Spoonerisms might relate to ideas as well as phrases, and told of a man who went to a dentist and was asked to open his mouth that the dentist might insert his finger. "No," said he, "you might bite it." Some of Jackson's chance remarks were illuminating—for example, his description of the writing of Carlyle as "glorified swearing." With a few eloquent words about his old chief, Dr. Wilson gave the toast "Jackson," which was honoured in silence.

OTHER RECOLLECTIONS

Dr. James Taylor, who worked with Jackson at Queen Square, exhibited some Jacksonia—photographs, drawings, and other documents, especially postcards, which Jackson favoured for correspondence. He also related some personal impressions. Jackson was subject to migraine, and on one occasion when Taylor was approaching, Jackson waved him off: "Stop! I am just observing my migraine." Dr. Wilfred Harris exhibited three of Jackson's letters which had been lent him by the General Medical Council. One was a request by Jackson, who had qualified M.R.C.S., L.S.A., in 1856, to be registered under the new Act of 1858. Jackson, said Dr. Harris, did not "suffer from over-education"; he once, indeed, expressed his thankfulness that he had never been to a university. It left his mind more free to pursue its own avenues of thought. His natural bent was to philosophy, and he took Herbert Spencer as his model. He was remarkable for his concentration, careful observation, and unprejudiced recording. In some respects he might be called lazy; he had no patience for the spade work of experimental physiology, and perhaps for the same reason he never wrote a textbook, though responsible for 300 papers, all bearing on neurology in some form or other, from philosophical speculation to the psychology of a joke. His creed was a mild agnosticism, his logical brain refusing to permit him to believe in a future state. For the thirty years following his wife's death—she, by the way, had attacks of Jacksonian epilepsy—he lived a solitary, bachelor-like existence. Dr. Harris showed Jackson's indirect ophthalmoscope—a curious instrument lighted by an oil flame burnt inside the tube.

Professor K. H. Bouman, professor of psychiatry and neurology at Amsterdam, in a graceful tribute, said that in his country Jackson's name was the pre-eminent one in neurology, and presented to the president a book with Jackson's signature in it. Dr. A. M. Douglas from New Zealand, a grandnephew of Jackson by marriage, added a few words of appreciation on behalf of the many connexions of Jackson on the other side of the globe. Sir Farquhar Buzzard, whose father was one of Jackson's great friends, told how it was a tradition in his family that Jackson saw the future Regius Professor a few days after his birth and demonstrated on him how a baby could be lifted by the grasp of its fingers. The last of these informal speeches was by Professor Edwin Bramwell. Jackson, he said, was an elusive personality, one whose reserved manner and sensitive temperament made intimacy difficult. He gave a little picture of his last years at Queen Square. He would arrive in the hall and ask

if there was anything to interest him ; his attention would be directed to some point on which he might spend five minutes or half an hour, and then he would leave and return in an hour or two with some paper elucidating the point under discussion. Of the personal influences which went to the shaping of Jackson, Professor Bramwell mentioned the teaching of Sir James Paget, the friendship of Sir Jonathan Hutchinson, and his association with the brilliant Brown-Séquard. But he was inclined to think that the greatest impression was made at an earlier time by Thomas Laycock, a remarkable personality, who wrote books which to-day were well worth reading, notably his *Nervous Diseases of Women*. Laycock left the York School of Medicine, where Jackson was educated, when his student was only 20 years of age, but the mental outlook of the two men was so similar that some lasting influence must have been imparted.

[The photograph is reproduced by kind permission of Dr. Gordon Holmes, Editor of *Brain*.]

HEALTH OF SCOTLAND

The sixth annual report of the Department of Health for Scotland,[1] dealing with the year 1934, shows several features of continued improvement of health in the Scottish population. Both the general mortality and the infant and tuberculosis death rates were lower than they had ever been before, and as shown by the Report upon Incapacitating Sickness among the Insured Population, published in the *British Medical Journal* of March 30th, 1935 (p. 666), there was less incapacity from sickness than in previous years. On the other hand, the maternal mortality in childbirth remains much as before, and the death rates from diseases of the heart, cancer, etc., which are particularly characteristic of later life, have continued to increase. The report points out that the birth rate and death rate are now little more than one-half of what they were sixty years ago. This implies that there are relatively fewer young people in the country, and that in future there will be still fewer. As a result the death rate from the conditions incidental to advanced years may be expected to rise, and this will be still further influenced by the recent introduction of successful treatment for such conditions as diabetes and pernicious anaemia, so that persons suffering from these now die at a later age than formerly. The death rate in 1934 was 12.9 per 1,000, the principal causes of death being heart disease (11,427 deaths), malignant tumours (7,558), cerebral haemorrhage (6,618), pneumonia (4,533), and tuberculosis (3,704). While the number of deaths from cancer continues to rise, it is believed that when the ageing of the population and improved diagnosis are taken into consideration, these factors are sufficient to account for the increase. The large Scottish hospitals are co-operating with the Radium Commission in the investigation of the cause and treatment of this disease, and in March, 1934, the Cancer Control Organization was established in the south-eastern counties to co-ordinate research, facilitate diagnosis, follow up cases, and provide grants for research and treatment. A noteworthy feature of infectious disease was the high prevalence of diphtheria, although measles was responsible for more deaths during the year than scarlet fever and diphtheria combined. Attention is drawn to the steady increase in the public demand for hospital treatment, which is not peculiar to any clinical type of case nor confined to any particular social class, and which is creating new problems of hospital provision and administration. The report emphasizes the fact that there is little evidence of any recognizable malnutrition associated with unemployment.

HOUSING

During the year under review 18,650 houses were built with State assistance, which is rather less than the output of 1933, but considerably more than that of 1932. During the year the Department approved of tenders by local authorities for 20,412 houses, which is a record, and at December 31st local authorities had begun 23,716 houses, so that an unusually high output of completed ones may be expected during 1935. Since 1919 the number of State-aided houses built is 183,390, and to these must be added 26,474 working-class dwellings built without State assistance, making a total of 209,864. These new houses contain a population of about 850,000 persons, more than one-sixth of the total population. The Royal Commission on Housing, which reported in 1917, declared that a building programme of 235,990 houses was then required, so that it is evident that the house shortage is being rapidly overtaken. The cost to the State in Exchequer subsidies from 1919 to the end of 1934 was £18,234,978. It is estimated that after allowing for the full use of all existing fit houses, over 100,000 new ones are still required to abolish overcrowding. Under the Housing (Rural Workers) Acts, and with the aid of State and local authority grants, 17,101 existing houses in rural areas were reconditioned by the end of 1934. The first place in administrative effort during 1934 was given to slum clearance, and excellent progress was made. During the year local authorities built 8,598 houses specifically to replace condemned ones, and by the end of 1934 they had under construction 20,044 houses to replace slums as against 11,193 at the end of 1933. The report points out that one of the essentials of successful slum clearance is the building of houses of three apartments and upwards. Nearly one-half of all the inhabited houses in Scotland are at present of one and two rooms, and even after slum clearance has reduced their numbers there will be no danger of a shortage of them. The Department continues to call for periodical reports of the work done by local authorities in rural areas to improve the cottages of farm servants. So far over 29,000 of these have been inspected, and 14,111 had been found unfit for habitation. Of these about 9,000 have already been improved, mostly with assistance under the Housing Acts, and 654 have been demolished or closed. Under the Town and Country Planning (Scotland) Act, 1932, some progress has been made. It is urged, however, that local authorities have not yet given a sufficient place to far-sighted planning and to avoiding the dangers of uncontrolled development. At the end of 1934 ten planning schemes had been approved by the Department and were in operation, involving about 90,000 acres. Four of these were for Glasgow, a large one covering ninety-six square miles for Aberdeen and district, three for Edinburgh, one for Dunfermline, and one for Airdrie.

GENERAL SANITATION

The demand for water supply, the report states, is progressive, for while in 1890 ten gallons per head per day were considered sufficient for domestic purposes, in 1898 fifteen gallons were regarded as the minimum, and at the present time about forty gallons are provided in most burghs, while the increasing number of houses with modern sanitary conveniences make a still rising demand. The drought of 1933 showed that the organization of supplies was defective, and in January, 1934, the Department called for reports from local authorities on the adequacy of their water supplies during the previous year. Out of 787 supplies, 300 were found to be inadequate. It was suggested with regard to these that while augmentation might be necessary in some areas, measures of conservation might be appropriate in others. As an illustration, the burgh of Kirkcaldy experienced a serious shortage of water estimated at about 2,000,000 gallons a day, while the county council at the same time had a surplus estimated at 2,890,000 gallons daily. It was hoped that progress might be made towards a joint use of supplies by neighbouring local authorities, and in 1934 two Acts of Parliament dealing with the water supply were passed giving powers to the Department for this purpose. Collection of refuse is becoming more efficient as a result of improved methods and the introduction of more suitable mechanical vehicles. This increased efficiency has often

[1] Cmd. 4837. H.M. Stationery Office, 120, George Street, Edinburgh. (3s. 6d. net.)

been attained without additional burden on the ratepayers, and one local authority in an industrial area, by the introduction of more efficient methods, found that the cost of public cleansing fell from 5s. 1d. per head of the population in 1926 to 3s. 7d. in 1934, despite the fact that many new houses had been built.

FOOD SUPPLY

The Milk Act, 1934, came into operation in August, and made available substantial subventions in aid of the milk industry. A large proportion of this will be used to assist the Milk Marketing Board to provide daily one-third of a pint of Grade "A" (T.T.) milk for school children at a cost of one-halfpenny per head. The Committee on Cattle Diseases recommended that routine veterinary inspection of dairy herds should be obligatory on all local authorities; that a scheme for the eradication of bovine tuberculosis should be initiated; and that no liquid milk should be sold that did not attain at the farm to a fixed standard of cleanliness approximating to that required for Grade "A" milk. The reports of veterinary inspectors for 1933 have shown steady improvement in cleanliness and condition of cattle and in methods of milking and handling. The Department published amended regulations, to come into operation on March 1st, 1935, imposing further safeguards on the importation of meat and meat products into Scotland. The total number of food and drug samples taken during the year to September 30th was 16,029. Milk was found adulterated in 12.5 per cent. of the samples, the result being about 25 per cent. in the counties and 10 per cent. in the towns.

MATERNITY AND CHILD HEALTH

The welfare schemes of local authorities now extend under statute over the whole country, some in co-operation with voluntary agencies, and others, such as the medical inspection of school children, limited to official activity. It is stated that gross want of food or clothing or skilled aid in sickness is now a thing of the past. The infant mortality for 1934 was 78 per 1,000 births as compared with 81 in 1933. The mortality rate among pre-school children of 1 to 5 years was 9 per 1,000 as against 8 in 1933, and the chief causes of death in this age group in order of importance were: bronchitis and pneumonia, followed by measles; a long way beneath these were diphtheria, tuberculosis, violence, and whooping-cough. Among children of school age from 5 to 15 years deaths numbered 1,884 as compared with 1,740 in 1933, and the chief causes in order of severity were: diphtheria, violence, tuberculosis, heart disease, pneumonia, and scarlet fever. With regard to maternal welfare, the schemes of local authorities, including the work of ante-natal centres, visits by health workers, provision of hospitals and convalescent homes, and medical attendance or calls by midwives, proceeded as before. The proportion of women attending ante-natal centres during 1933, calculated on the subsequent number of births, was about 33.5 per cent. as compared with 8.7 per cent. in 1925. It is stated that in Glasgow the maternal mortality among mothers coming to the centres was 4.11 as compared with a rate of 5.9 for the city as a whole. A feature of recent years has been the increasing proportion of confinements taking place in maternity institutions. In 1927 the percentages of cases attended respectively by doctors, by midwives, and in institutions were 50, 39, and 11, while in 1933 the corresponding figures were 48, 28, and 24. There were approximately 976 beds allotted to maternity cases in institutions in Scotland, and new maternity hospitals are to be provided in Kirkcaldy, Dunfermline, Kilmarnock, Greenock, and Aberdeen. The average number of births attended during 1933 by each midwife in independent practice was twenty, the approximate figure being in county areas about ten per midwife, and in large burghs about thirty. The calls for medical assistance in emergencies under the rules of the Central Midwives Board during 1933 amounted to 28 per cent. of the births attended by midwives. There were 1,109 notifications of puerperal fever and 1,053 of puerperal pyrexia during the year under review. Concerning the infant and pre-school child, the report suggests that more might with benefit be done for children between 1 and 5 years; there was accommodation for approximately 2,200 children in day nurseries, child gardens, etc. Notifications of ophthalmia neonatorum numbered 1,466, approximately the same as in 1933, and during the year five cases with appreciable loss of vision occurred, but the Department is satisfied that there has been definite progress in the control of this cause of blindness. The number of schools under inspection during the year was 3,352, with 841,991 children on the registers; the number of medical examinations carried out was 481,731. The findings at these inspections showed that children suffered from the following disorders in the percentages given: enlarged lymphatic glands, 18.7; defective teeth, 70; lung disorders, including bronchitis and tuberculosis, 3.2; enlarged tonsils, 17.5; defective visual acuity, 16.7; external eye diseases, 5.1; nasal catarrh, etc., 4.6; nutrition below average, 5.3; anaemia, 2.4; and various other conditions in less than 2 per cent. of cases. The dental staffs engaged on school work consisted of forty-eight whole-time and thirty-five part-time dentists, representing one dentist for approximately 14,000 school children.

(To be concluded)

MEDICAL SICKNESS, ANNUITY AND LIFE ASSURANCE SOCIETY

At the annual general meeting of the Medical Sickness, Annuity and Life Assurance Society, Ltd., Dr. F. C. Martley, chairman of directors, in presenting the accounts, said that in the life assurance section the business produced was just under half a million; this was a slight fall on the previous year, and was explained by the fact that the 1933 figures included the inaugural business transacted in connexion with the schemes for British Medical Association members and insurance practitioners. In the ordinary "bread-and-butter" business of an insurance company, comprising whole life and endowment assurance, there had been a noteworthy increase. There had been a greater number of claims, as was only to be expected with an ascending liability, but the actuary was satisfied that the mortality experience was favourable to the society.

Dr. Martley dwelt at some length on the question of loans on medical practices, a business which had been conducted by the society for seven years. The Board took the view, first, that life assurance cover was an essential feature, the cover being 10 per cent. more than the amount of the loan granted; secondly, that provision should be made for illness and the cost of a locumtenent; and thirdly, that arrangements should be made for a rate of interest acceptable to both parties, this having been fixed at 4½ per cent. where the applicant was putting up some of the capital and 4 per cent. when he desired to borrow the whole sum and could provide a guarantor. Up to the present just over a quarter of a million had been advanced, and nearly £100,000 had been repaid; so far there had been no bad debts. It was the practice to discourage applicants if it was clear, on the facts presented, that after embarking on a loan they would not be able adequately to support themselves and their families.

The report having been adopted, Sir William Willcox and Mr. W. H. Dolamore, the retiring directors, were re-elected, and the meeting carried the Board's recommendation that an interim bonus be paid on all with-profit policies for permanent sickness and accident insurance and life assurances becoming claims during the present year. Sir William Willcox, in proposing a vote of thanks to the manager, Mr. Bertram Sutton, and his staff, commented upon the wonderful progress of the society during the last few years, combined with a reduction in administrative expenditure with which any other society or company would find it difficult to compare. The resolution was carried, as was a further one expressing thanks to the chairman, Dr. Martley, for presiding at that meeting and for the exercise of constant initiative in the society's interests.

British Medical Journal

SATURDAY, APRIL 13th, 1935

HUGHLINGS JACKSON

On April 4th, a hundred years ago, there was born on a Yorkshire farm a man who has rightly been called "the deepest thinker in neuropathology of the past century." John Hughlings Jackson, whose centenary was commemorated last week at a dinner held by the Section of Neurology of the Royal Society of Medicine (see p. 769), did indeed make an unsurpassed contribution to medicine, and the tribute just cited will find an echo in the minds of all those who are familiar with his writings and can appreciate the magnitude of his achievement. Moreover, there are a few happily still with us who were his pupils and friends, and who cherish something warmer than respect for the benign and modest personality of this great man. Yet since his contribution was to the science and not to the art of medicine, and to a somewhat recondite branch of that science, his fame has been less widespread among his fellow countrymen than his achievement merits, and it is therefore fitting that in this his centenary year an attempt should be made to recall something of what Jackson means to neurology. And in this attempt it is necessary to realize the contemporary state of knowledge in that aspect of medical science of which he was one of the founders at the time he began his labours in the middle of the last century.

In his memorable Hunterian Oration[1] on the "Commemoration of Great Men," Wilfred Trotter dwelt upon the importance of considering this factor in the assessment of Hunter's work in words that we may not unfittingly apply to Jackson: "It needs all our imaginative sympathy to picture the twilit country in which his labours were carried on—the air is dim and thick, the range of vision short, the appearance of things ambiguous. . . ." To be precise, in clinical neurology there still remained to be achieved the isolation and identification of most of the clinical pictures of nervous disease which are now grown so familiar to us; nothing was known of the functions of the cerebral cortex; and the notion of cerebral localization of function was not yet born. As little was certainly known of the functions of the subordinate parts of the central nervous system. In this almost formless chaos Jackson began his investigations, and he achieved by careful and prolonged clinical study, and by the unresting contemplation of the facts of observation, a deeper insight into the nature of cerebral function than two generations of observation and experiment have since been able to yield, though these have indeed lent confirmation and added detail to some of his conclusions. From his study of those focal seizures that we now know as Jacksonian fits he succeeded in formulating a conception of the cortical representation of movement that still stands alone as an adequate and masterly generalization of the known facts. He elucidated by the same methods the laws that express the evolution of function within the nervous system, and showed that the action of disease is in a measure to reverse this process of evolution. The Croonian Lectures in which he propounded his views on this subject will always remain a classic in medical literature. They form a milestone in the progress of our knowledge of the nervous system. The speech function and its disorders were also the subjects of his investigations, and it is doubtful whether current thought on this difficult problem has yet reached the depth of insight revealed in Jackson's writings nearly half a century ago. It was in respect of his contributions to the study of aphasia that the great German authority Arnold Pick pronounced the eulogy quoted in the opening paragraph of this article; surely a striking proof of the essential modernity of Jackson's thought. There is indeed no branch of clinical neurology which he did not illuminate, but his work in this sphere is not the measure of his contribution to science; it has been not less valuable to physiology and psychology. For example, no one familiar with that great work of Sherrington's *The Integrative Action of the Nervous System* can read it without becoming aware of what it owes to Jackson's influence.

It has to be admitted that to the present generation Jackson's writings, hidden for the great part in the files of now extinct medical periodicals, have not been readily accessible. Happily this is no longer the case, for his friend and pupil Dr. James Taylor has recently edited and published his collected writings, and in thus repaying the debt which English medicine owes to Jackson he has also laid the present generation under a deep obligation. But despite these difficulties the increasing influence of Jackson's philosophic thought is a welcome sign that can have escaped no student of current neurological literature in this and other countries, and it is singularly appropriate that in his centenary year the International Congress of Neurology should be meeting in London, when the neurologists of all lands will pay their tribute to one of the masters of their science.

[1] *British Medical Journal*, 1932, i, 317.

TREATMENT OF HAY FEVER

With the advent of spring the sufferer from hay fever begins to seek methods of relief for this most persistent and distressing seasonal complaint, and Dr. Harley's statement in his paper printed in the current issue of the *Journal* (p. 754) that specific desensitization with Timothy grass pollen extract gives practically 100 per cent. relief in all cases would seem to fulfil all requirements. Other workers in England and abroad will, however, be disinclined to accept such a statement for two reasons: first, quite a large number of hay-fever patients react to grass pollens other than the Timothy pollen; and, secondly, a high proportion of seasonal hay-fever patients are also hypersensitive to dust, feathers, animal emana-

tions, and orris root (the basis of most cosmetics), as well as to pollen. In these cases, therefore, Timothy pollen can have only a non-specific effect. Most observers will agree that, providing the dosage is pushed high enough, skin reactions will be abolished and the patient freed from hay fever caused by the pollen with which he has been treated. As Dr. Harley's patients are tested with Timothy pollen alone, then only those who react to Timothy pollen are treated, with excellent results. But in this way a large number of cases not sensitive to Timothy pollen, but very sensitive to other pollens and to inhalant substances, will be missed and not diagnosed or treated as hay fever. In addition to patients with hay fever who have never proved sensitive to Timothy pollen, others are seen who have been sensitive, have undergone repeated courses of desensitizing injections with Timothy pollen, and still return with hay fever due to their sensitivity to other grass pollens. It would seem that a better method of prophylaxis would be to desensitize the patient with a mixture of the pollens to which he is sensitive in his own district. By employing the newer concentrated extracts a certain number of the pollens yielding positive skin reactions can be abolished each year, and usually the majority of cases will lose all their skin reactions to pollen after three years' intensive treatment. The other inhalational factors should not be overlooked. A nose irritated by specific pollens readily acquires a sensitivity to dust, face powder, or feathers, and unless due account is taken of these additional sensitivities all therapeutic measures which include pollen alone may prove inadequate. These sensitivities frequently explain the asthmatic symptoms which two out of every three hay-fever cases ultimately develop and the tendency for the symptoms to last longer and longer into the autumn and winter.

While discussing the recent advances in the technique of specific desensitization in hay fever, one is led to think of another method of treatment—that of avoidance or removal of the specific pollens. On the Continent and in America numerous types of air filter and pollen-free chambers have been designed and described as something new. But it is interesting to note that Blackley, the pioneer of hay-fever research, had already employed these filters. As a sufferer, he proved conclusively on himself, by testing grass pollen on his mucous membranes and skin, that pollen of the order Graminaceae was responsible for the disorder. He placed contrivances of his own invention over his eyes and his nostrils to prevent the specific pollens from reaching these membranes, and nine years later (1890) he designed a perfect mechanical pollen filter for the home of a sufferer: his goggles and nostril fittings are still in the possession of relatives. Blackley was also one of the first to show that pollen rubbed into the skin produced a dermatitis. It is only recently that the significance of this fact has been realized, and conclusive proof has been advanced that it is the pollen oil and not the pollen hay-fever antigen that is the cause of the dermatitis.

An urgent necessity in the British Isles at the moment is a botanical survey to determine the relative prevalence of the different hay-fever-producing pollens, such as has been accomplished throughout the United States. Although a large number of causative pollens have been determined[1] it is probable that still more escape our attention. With the determination of all the possible pollen and other inhalant causes of hay fever, the preparation of potent extracts, and the thorough desensitization of the patient each year until all skin reactions are abolished, hay-fever sufferers should be assured of freedom to carry on their usual occupations, and further meetings of the "hay-fever club" be unnecessary. This club is composed of sufferers who visit the island of Heligoland during the pollen season in order to obtain relief from their symptoms. Such relief is due to the relative absence of grass pollen. From time to time special resorts have been advocated for hay-fever sufferers. Generally pine regions have been chosen, for the shade, in addition to the pine needles, inhibits the growth of vegetation such as grass or weeds. As the news spreads and the resort becomes popular, the ground is cleared, building goes on, grass and weeds begin to grow, dust collects, animals accumulate, and soon the reputation of the resort is lost. Finally, various palliative measures should be mentioned. Dark glasses protect the eyes. The various ephedrines taken internally in doses of 1/2 to 3/4 grain night and morning relieve the severity of the attacks, but in the very severe spasms the injection of 2 to 5 minims of adrenaline hydrochloride solution is necessary. Numerous menthol, benzocaine, ephedrine, and adrenaline drops, ointments, and sprays have been marketed, but many patients have been made worse by their use. Cauterization and ionization of the nose at frequent intervals have a temporary palliative effect for which many patients are thankful; but proper specific desensitization is the only treatment with any permanent curative effect, and the more this is recognized the better the outlook for the patient.

[1] Bray: *Recent Advances in Allergy*. 1934. Second edition, p. 281.

MEDICINE AS A CAREER

The Incorporated Associations of Head Masters and Head Mistresses of Public Secondary Schools, in co-operation with the Ministry of Labour, have issued a series of pamphlets dealing with the various careers which may be chosen by the pupils in those schools when they reach the leaving age. Experience has shown that there is often lack of knowledge among both teachers and pupils as to opportunities for careers, so that only too often, especially in the case of girls, the choice is almost automatically made of what is described as "the well-trodden and crowded path of routine clerical employment." The attention of parents may well be more prominently directed to this series of "choice of career" pamphlets, which may be obtained for a few pence from the London Headmasters' and Headmistresses' Employment Committees, respectively,

Queen Anne's Chambers, Tothill Street, Westminster. There are two general pamphlets, one dealing with secondary school girls and the other with boys, which give in tabular form the outline of a large number of careers. Besides these there are now some twenty-two other pamphlets, each describing some particular class of career and its opportunities in considerable detail. Among these are "Chemistry, Physics, and Biology," "Pharmacy," "Veterinary Surgery," "Dentistry," "Nursing, Public Health Work, and Kindred Services," and "Medicine." The last-named[1] may be taken as a sample. It sets out in relatively short compass, but accurately and effectively, most of the general information given in the Educational Number of the *British Medical Journal* published annually in the first week of September, omitting, of course, the details as to particular schools of medicine and the individual requirements of the various licensing bodies. After a very short introductory statement of the development of medicine, too brief to have much point or value, modern medical education is outlined and the pre-registration educational requirements are set out; the nature and cost of the educational and social activities of a medical school are described with a note on opportunities for obtaining scholarships and other similar helps; the prospects, financial and otherwise, of general practice (including insurance work), of specialist and consultant practice, and of public health work are sufficiently dealt with, and the usual methods of entry upon each of these spheres are noted. A short account is then given of the Defence Force Medical Services, the Indian Medical Service, the Colonial and other over-sea Services, the Prison Medical Service, and service in the Mercantile Marine. The place of women in medicine has a separate paragraph, and under the head of "Bibliography," the publications of the General Medical Council, the *British Medical Journal*, the *Lancet*, and the British Medical Association's *Handbook* for recently qualified practitioners are referred to, as also is the book on insurance practice by Harris and Sack, which is published by the Association. One general observation may be quoted: "The close personal relationship of the general practitioner with patients is a characteristic of the profession. The modern tendency is more and more to study preservation of health in varying circumstances rather than to treat the disease when developed; and from this point of view it is more customary than formerly to tell the patient in simple language the reason for the illness and the method and purpose of the remedies proposed." It will be seen that the pamphlet on the medical profession is comprehensive, sufficiently detailed, and accurate. This should indicate that the whole series of pamphlets is likely to perform an exceedingly useful function.

MINUTIAE OF HOSPITAL FINANCE

Sir Frederick Menzies, in his introduction to the part of the Annual Report of the London County Council which deals with hospital finance,[2] mentions the value of mechanization in the central accounting office, saying that by the installation of an accounting machine it has been possible to do without five clerks. If the detailed analyses, running to a hundred columns of closely compacted figures, worked out to fractions of a penny, have emerged from this accounting machine, it must be fearfully and wonderfully made. All sorts of curious facts come out if one cares to go over the figures with a microscope, as, for example, that the cost of patients' funerals at Mile End Infirmary works out at threepence per occupied bed per week, or that the weekly cost of crockery at Dulwich Hospital is threepence-halfpenny per occupied bed. We even learn how many pieces of laundry are washed at each hospital for each patient per week, and how many for each member of staff, and how much soap and soda are used at each institution per thousand articles washed. In the internal administration of a hospital service no doubt such analyses are very useful, but it is doubtful how far their general publication serves a purpose. The King Edward's Hospital Fund for London publishes some tables relating to voluntary hospitals, but the County Council goes into much more detail. The food bill at each hospital, for example, is separated into provisions for patients and rations for staff. Taking the largest of the county hospitals—namely, Lambeth, with an average of 1,214 beds occupied daily with both acute and chronic medical and surgical cases—the weekly cost of provisions and stimulants for each occupied bed works out at an average of 4s. 7d., that of surgery and dispensary at 3s. 1½d., and that of staff at 22s. 4d. In this last sum the remuneration of the medical staff is represented by 2s. 5d., being little more than one-third of the cost of the nursing service, or one-fourth of the cost of the general domestic service. Such items as furniture and equipment, bedding and house linen, heating and lighting, and laundry account for another 12s., and when to these are added charges in respect of capital outlay, superannuation fund, and establishment, we arrive at an inclusive weekly cost per occupied bed of £2 17s. 3d. That is low in comparison with other hospitals of the same group, and lower still in comparison with the hospitals which take acute cases only, where the cost of the medical service is higher, reaching 5s. 7d. per week per occupied bed at the New End Hospital. A detailed comparison with the costs at the voluntary hospitals is not possible because of a different method of separating items, but so far as totals are concerned, in the twelve teaching hospitals of London in 1932 the weekly cost per occupied bed ranged from £3 5s. 1d. at University College to £5 0s. 10d. at the London, whereas in the sixteen county general hospitals for acute cases the cost ranged (in 1933) from £2 15s. 10d. at St. James's, Wandsworth, to £5 4s. 8d. at St. Peter's, Whitechapel. In the hospitals which take only chronic cases the cost is much lower, even down to £1 1s. 6d. at Hackney Hospital. At the largest of the "acute" hospitals for infectious diseases, the North Eastern, with an average of 557 beds occupied daily, the total cost per bed per week is £3 2s. 11d., of which amount salaries and wages account for £1 2s. 8d., the apportionment for medical service being the modest amount of 2s. 10d. At King George V Sanatorium for male tuberculous cases, with 229 occupied beds, the weekly cost is £2 17s. 4d., and at the large children's hospital, Queen

[1] *Choice of Career Series, No. 20. Medicine.* London: H.M. Stationery Office. 1934. (3d. net.)

[2] *L.C.C. Annual Report of the Council, 1933.* Vol. iv (Part II). Public Health—Hospital Finance. Westminster: P. S. King and Son, Ltd. (1s.)

Mary's, Carshalton, with 1,156 patients, the inclusive cost per occupied bed is £2 12s. If the reader is not already surfeited with figures there is one other which has some interest. The London ambulance service in the accident section costs 21s. 10d. per patient, and the average run on each journey, from station back to station, is four and a half miles. While grateful for these figures, we hope the municipal hospitals will not get the statistical complex too acutely.

SYNTHETIC ANTIMALARIAL DRUGS

An interesting review of this rapidly developing subject has been given by Dr. Richard Green in a series of lectures.[1] The author has had wide experience of antimalarial work in the Federated Malay States, where the plantation system provides favourable conditions for the systematic study of the value of antimalarial remedies. Hence this review is of exceptional value. Dr. Green gives a clear account of the chemical structure and relations of the two most important synthetic antimalarial drugs—namely, plasmoquine and atebrin. The therapeutic characteristics of these drugs are as follows. Quinine, atebrin, and plasmoquine have lethal actions of very similar intensity on both the asexual and sexual forms of benign tertian and quartan malaria parasites. In the case of subtertian malaria, quinine and atebrin destroy the asexual but not the sexual forms, whilst plasmoquine destroys the sexual but not the asexual forms. As regards toxic effects, quinine produces unpleasant symptoms, but yet can be taken continuously for long periods without danger. Plasmoquine is more toxic ; doses of even 0.03 gram daily produce methaemoglobin in the blood in a fairly high percentage of cases, while larger doses have caused death. Atebrin produces few unpleasant side-effects, but it has a cumulative action, and we do not yet know whether it can be safely administered for long periods. The chief advantages claimed for plasmoquine are that it reduces chances of infection by removing sexual forms in cases of subtertian malaria, and that its combination with quinine reduces the frequency of relapses in cases of benign tertian malaria. Dr. Green discusses carefully the practical value of gametocyte prophylaxis with plasmoquine, and concludes that the conditions under which this is likely to be effective are comparatively rare. In general, he thinks that plasmoquine has a somewhat limited value in the treatment of malaria. Atebrin is a more serious rival to quinine, and the author brings forward evidence that atebrin given for short periods is more effective in preventing relapses than is quinine when this is given for short periods. This is a point of great practical importance, because very often it is impossible to arrange for long-continued antimalarial therapy. The author points out, however, that quinine and atebrin have a very different status. Quinine has been used for a century, and all its possible toxic actions are known completely, whereas atebrin is a new drug, and its toxic potentialities have not yet been fully ascertained. Finally, Dr. Green discusses a number of other newer antimalarial drugs, and deals briefly with certain secret proprietary remedies. The latter have the same characteristics as their fellows in other fields of therapy. The best consist of weak preparations of quinine sold at fantastic prices ; others are devoid of any antimalarial action. The impudence of the quack medicine vendor is proverbial, but it is surprising to learn that a weak solution of formalin in coloured water was advertised intensively throughout Malaya as a specific for the cure and prevention of malaria.

[1] Lectures on the Development and Use of the Synthetic Anti-Malarial Drugs. By Richard Green. Bulletins from the Institute for Medical Research, Federated Malay States. No. 2, 1934. Kuala Lumpur: F.M.S. Government Press.

OLIVER CROMWELL'S HEAD

The question of the genuineness of the relic known as the Wilkinson head, which purports to be the head of Oliver Cromwell, has been debated for many years. The discussions have never been of a kind to carry conviction ; but recently Professor Karl Pearson and Dr. G. M. Morant, through the kindness of Canon Horace Wilkinson, the possessor of the relic, have been entrusted with the head and have carried out an investigation on more scientific lines, including a critical examination of all available evidence—literary, artistic, and antiquarian. The details of this laborious inquiry are recorded in an offprint from volume xvii of *Biometrika*, entitled *The Portraiture of Oliver Cromwell*.[1] The authors find that, although direct evidence is lacking, circumstantial evidence is sufficiently strong to render it a " moral certainty " that the Wilkinson head is the head of Oliver Cromwell. With regard to the history of Cromwell's head, all that is known is that the decapitation of the embalmed body took place at Tyburn about two years after Cromwell's death, that the head was fixed on a pole and set up on the roof of Westminster Hall, where it remained for about twenty-four years, and that it then disappeared (about 1684). The earliest unequivocal reference to the Wilkinson head is ninety-one years later than this (1775), from which date to the present time the history is clear. There is, however, a reference in 1710 to a head as then existing and purporting to be that of Cromwell ; the authors consider that this was probably the Wilkinson head, but proof is lacking. On the whole there is nothing in this history that can be regarded as contradicting the theory that the Wilkinson head is that of Cromwell, though it affords no proof, and the head itself presents strong evidences that it is authentic. It seems clear from an examination of the head that it had been decapitated from an already embalmed body, as actually occurred in Cromwell's case ; and this sequence—decapitation preceded by embalming—was very unusual, so much so that the authors are unable to adduce any other instance, except that of Ireton, whose embalmed body was maltreated at the same time as Cromwell's and in a similar manner. (The transverse frontal measurement of Ireton's head, however, is much less than that of the Wilkinson head.) Further convincing evidence is afforded by the life and death masks of Cromwell, for frontal and profile outlines of the Wilkinson skull when superimposed on corresponding photographs of the masks are found to fit with remarkable exactness. Several other less striking evidences adduced by the authors tend to confirm the genuineness of the Wilkinson head. Not the least valuable part of the authors'

[1] *The Portraiture of Oliver Cromwell, with Special Reference to the Wilkinson Head.* By Karl Pearson, F.R.S., and G. M. Morant, D.Sc. London: Cambridge University Press. (36s.)

work is the beautiful series of photographs of portraits, busts, miniatures, and life and death masks of Cromwell, and the discussions thereon. The authors have also been able to make a rough estimate of Cromwell's brain-weight, which they find to have been only slightly above the average—not unusually large, as has been supposed.

RESPIRATORY SEQUELS OF MEASLES

A study of the incidence of the respiratory sequels of measles by J. S. Westwater is one of the many interesting papers in the medical supplement to the report of the hospital services of the London County Council.[1] It may be said in passing that the annual report, of which this is volume iv, Part III, is for 1933, although the date of publication of the present issue is 1935, so that opinions and results expressed may already be a long while out of date. Dr. Westwater's paper deals with a follow-up of nearly two hundred children who had suffered from measles in the Park Hospital. *X*-ray facilities were not available, so that reliance was placed upon clinical findings with ancillary use of the Mantoux tuberculin reaction. The majority of the children were examined two to four months after leaving hospital ; those with a positive tuberculin reaction were re-examined at subsequent intervals—in some cases up to a year—after their attack. Of the 193 children traced, approximately 10 per cent. had persistent symptoms such as a cough, without physical signs of respiratory infection, while in addition about 8 per cent. actually had had an acute bronchitis or pneumonia after leaving hospital or had clinical evidence of a chronic respiratory catarrh or bronchitis at the time of examination. It is thought that this incidence of respiratory sequels is probably an over-estimation for children as a whole, since cases are selected for admission to hospital partly on account of pulmonary complication of the primary measles. Further points appear in the detailed analysis here summarized. The younger the child the more likely is it to be affected with pulmonary complications. If there has been previous respiratory disease such complications are more common. If the tuberculin test is positive there is more likelihood of chronic non-tuberculous catarrhal affections of the lungs, but the occurrence of tuberculosis as a chronic pulmonary infection was not detected in a single one of the thirty-four children with a positive tuberculin test during the period of the follow-up. The most important point in the results, viewed from the aspect of prevention, seems to be the high incidence (over 40 per cent.) of children in whom chronic pulmonary disease found after measles was associated with a history of lung disorder before the acute specific fever. Many of these dated from recurrent acute bronchitis in infancy. Curiously enough whooping-cough, when it preceded measles, did not appear to lead to any greater liability to pulmonary involvement. From this study it may be deduced that adequate convalescence will not, unfortunately, prevent or cure all instances of chronic lung infection, and, on the more hopeful side, that tuberculosis as a sequel of measles is not so common as textbooks generally assert.

[1] Annual Report of the London County Council for 1933. Vol. iv, Part III. (5s.)

EVIPAN ANAESTHESIA

Interest in the use of evipan still continues. Up to the present time the reports of its action have been confined almost entirely to the Eastern Hemisphere, but it is now on trial in the United States under the name of evipal. Livingstone, Emy, and Lieber,[1] who are apparently only the second group of American workers to publish their results, have employed the drug in 280 cases, covering a wide range of surgical conditions. They are satisfied that evipan is of great value in minor surgery and has many practical advantages over other general anaesthetics. They suggest, for example, that it may be safer than gas and oxygen for negroes, in whom the difficulty of recognizing cyanosis has led to several recorded deaths. No attempt was made to give the drug continuously, and, when necessary, anaesthesia was supplemented by gas and oxygen. In one case sloughing occurred on the patient's arm owing to faulty injection. It would appear from their paper that the dose of evipan to be administered is estimated beforehand, based partly on the patient's general physique and partly on the length of time of the operation. This is hardly so accurate as the method generally employed in France. Moure, Fontaine, and Rouault[2] insist that the dose must be accurately calculated for each patient. They start by injecting the evipan solution very slowly, at the rate of 1 c.cm. per minute, until the patient's jaw drops. They regard this sign as providing a fairly accurate measure of the minimal quantity of evipan necessary to produce sleep in any particular patient. The dose is then doubled by injecting more evipan at a slightly faster rate, and after a brief pause the operation is begun. Mossadegh[3] has also employed this technique for gynaecological cases. He injects the initial dose of evipan at the rate of 1 c.cm. per minute, and having noted the dose necessary to produce dropping of the jaw injects an equal quantity at the rate of 1 c.cm. in thirty seconds. Further doses are then given at intervals if it is found necessary to prolong anaesthesia. Both sets of authors agree that the injection of an opiate one hour before operation provides a quieter anaesthesia and enables them to use less evipan. Guy,[4] in a series of 150 cases, has studied the various factors on which a quiet and efficient anaesthesia with evipan depends. Of chief importance are the age of the patient, his general condition, and the site and nature of the operation. Patients over 60 years of age had a longer and quieter anaesthesia than younger patients, in whom it was sometimes necessary to give supplementary anaesthesia. Feeble and toxic patients reacted better to the drug than those who were young and vigorous, especially the muscular or alcoholic types. It was also found that operations on a sensitive area such as the perineum were not the most favourable for a quiet evipan anaesthesia. None of the authors mentioned above record any untoward happenings due to evipan in their series of cases or had cause for alarm during anaesthesia. All of them are convinced that in minor surgery at least evipan is a useful addition to our list of anaesthetic agents.

[1] *Amer. Journ. Surg.*, December, 1934, p. 516.
[2] *Bull. et Mém. Soc. Nat. de Chir.*, November 24th, 1934, p. 1178.
[3] *Bull. de la Soc. d'Obstét. et Gynécol.*, October, 1934, p. 489.
[4] *Presse Méd.*, December 29th, 1934, p. 2101.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some of the major medical disorders met with in general practice

SEPTICAEMIA

BY

C. E. LAKIN, M.D., F.R.C.P., F.R.C.S.

In clinical medicine the term " septicaemia " is employed to denote an infection of a high grade of intensity in which organisms make their appearance in large numbers in the circulating blood and are rapidly and widely dispersed through the tissues of the body, the disease being the expression of the interaction between the invading organisms and the tissue elements of the host. The temporary presence of organisms in the blood forms an integral phase of many infections, such as typhoid fever and pneumonia, their transitory appearance being usually spoken of as bacteriaemia.

In bacteriaemia the organisms generally exist in the blood for a certain period of time, the length of which can be stated more or less accurately. In the later stages of septicaemia the organisms actually multiply in the blood stream, and are likely to persist up to the moment of the fatal termination. Secondary lesions may arise in bacteriaemia, and when these happen to affect vital tissues, as, for instance, when meningitis occurs in pneumonia, there may be a fatal issue without widespread generalization throughout the tissues. The generalization or localization of an infection is determined, of course, not only by the character of the invading organism, but also by the resistance of the host. Yet it must be allowed that a bacteriaemia may go on to a septicaemia. Instances of rapid and widespread generalization of infection are well exemplified in streptococcal and staphylococcal septicaemias, and it is with this type of case that we are more nearly concerned in the present contribution.

Septicaemia may be further complicated by pyaemia, a condition in which there is suppurative phlebitis at the site of the primary lesion with detachment of particles of the infected thrombus and their impaction in some distant situation, with the formation of secondary abscesses. Pyaemia is more common in cases of staphylococcal than in streptococcal septicaemia.

Treatment of the Primary Focus

In the earlier stages, then, of a septicaemia a rapid and continuous invasion of the blood stream is taking place by organisms from the primary focus or from multiple foci which have developed during the course of the disease, and the actual multiplication in the blood stream would appear to be a rare event till quite late in the process. In the case of suppurative diseases in which the primary and secondary foci are accessible to surgical intervention the results of adequate drainage bear striking witness to the ability of the blood to deal with even a massive grade of infection if continuous reinvasion can be prevented.

This must not be taken to imply that every case in which localized infection has occurred is to be treated by a surgical incision. Incision of many an infected punctured wound has been the means of initiating the fatal septicaemia which it was intended to prevent. The knife, in attempting to liberate pus, has cut through the encircling protective zone successfully built up by the inflammatory reaction of the tissues, and massive infection of the tissues beyond the protective zone has led to a widespread and overwhelming invasion of the blood stream. Hot fomentations, in order to encourage vascular dilatation and exudation of phagocytes, should therefore be the treatment adopted in dealing with a wound such as a pathologist might sustain while making a post-mortem examination or a surgeon in dealing with some infected condition. When at the centre of such a wound pus begins to show itself beneath the epithelium, great care should be taken not to cut through the surrounding protective zone, but only to liberate the presenting pus with the point of the scalpel. When a wound of this sort has been inflicted, if it can be ascertained that the source of infection was streptococcal in nature, anti-streptococcal serum should be given. Antiscarlatinal serum appears to be the most efficacious, and 10 c.cm. should be injected subcutaneously as early as possible, and a further supply kept in readiness for use the following day if any signs such as a rise of body temperature and quickened pulse indicate the probability of a generalized infection, when, as will be seen later, larger quantities may have to be given by the intravenous route.

Cryptogenic Infections

Apart from cases arising secondarily to an easily recognized primary infected focus, septicaemia may arise in so-called cryptogenic infections, where the site of entry of the infection may be undiscoverable, at any rate at first. In some of these cases the patient is already debilitated, and the clinical picture may be so variable that the condition may not be recognized as one of septicaemia unless an organism has been obtained by culture from the blood. In some pyrexia is continuous, in others remittent or intermittent, with a temperature chart showing spikes of 105° or 106° F. In cases of extreme virulence the temperature may be raised scarcely at all. Rigors are frequent, and often associated with profuse sweating. The pulse is small, soft, and rapid. The tongue may be furred and dry, but in streptococcal cases is often smooth, red, or raw-looking, and diarrhoea is frequent. The urine contains albumin, and red cells and casts are commonly met with. Prostration, with progressive anaemia and wasting, is the rule. While some cases remain preternaturally mentally clear, others may become delirious. Examination of the skin frequently discloses the presence of petechiae or purpuric areas, and erythema. Bronchopneumonic patches are likely to be present in the lungs. The spleen may be enlarged, though often difficult to feel. Blood examination often reveals a leucocytosis, with a relative increase in polymorphonuclear leucocytes, though in some of the most acute forms leucopenia may be encountered. The diagnosis will be established when a positive blood culture is obtained.

General Therapeutic Measures

If the condition is well established when the patient is first seen, probably some form of intravenous therapy will be carried out, but it cannot be insisted upon too strongly that general measures directed to maintaining and increasing the patient's natural resistance are of no less, and probably of greater, importance. These will include:

1. *Complete Rest in Bed.*—The more a patient exerts himself the quicker will the heart beat, and more blood will be hurried through the infected focus in unit time, with the result that toxins and organisms will be disseminated in increasing degree throughout the body.

2. *Open Air.*—Whenever practicable cases of septicaemia should be at rest in a protected situation in the open air. This will tend to the greater comfort of the patient in that more rapid evaporation from the skin is encouraged; the greater degree of light and gently moving air will exert a metabolic influence upon the skin, while a more abundant supply of oxygen will lead to increased transpiration of exhaled aqueous vapour from the lungs. Appetite will be increased, and restlessness and tedium diminished.

3. *Diet.*—This should be carefully chosen in relation to fever and diminished digestive secretions, but should be ample in amount. An abundant supply of fluid in order to maintain diuresis and increase the excretion of toxins and organisms should be forthcoming. Drinks containing fruit juice and glucose should be liberally provided.

4. *Judicious Nursing.*—Restless activity on the part of a nurse cannot be too strongly deprecated. An experienced nurse, who is neither too subservient to the fetish of washing a patient twice a day nor bent on making constant needless demands which only serve to weary the patient, is essential if a successful issue is to be obtained. Hydrotherapy may be necessary to control the pyrexia and induce sleep.

5. *Drugs.*—Elimination may be assisted by adding sodium citrate to freshly made lemonade or orangeade. Small doses of hydrarg. c̄ creta or salol (5 grains thrice daily) may be of service in relieving abdominal distension or diarrhoea. Cardiac tonics, including digitalis, will be of service when heart failure threatens. Alcohol should be allowed if the patient has been in the habit of taking it.

Serum and Vaccine Therapy

In acute streptococcal cases antiscarlatinal serum is likely to yield better results than polyvalent serum. Whichever variety is used 20 to 60 c.cm. may be given intravenously or intramuscularly, and 20 c.cm. or more may be injected every six or eight hours by the same routes till several doses have been administered if benefit, as judged by the temperature, pulse rate, and general condition of the patient, appears to be accruing. Some prefer to prescribe doses of 50 to 100 c.cm. of serum well diluted with normal saline and repeated once in the twenty-four hours. In giving serum the usual precautions as regards the previous administration of horse serum must be observed, and desensitization may have to be carried out as a preliminary measure. For staphylococcal, gonococcal, and pneumococcal cases corresponding sera can be procured, and are usually prescribed in 25 c.cm. doses.

If as a result of treatment on these lines definite improvement results, the question arises as to whether vaccine treatment should be instituted. If the case is one that appears to have originated from some hidden focus of infection as opposed to one in which an infected wound was responsible for the septicaemia, vaccine therapy may be undertaken. It is wise to start with a small dose of vaccine prepared from the organism obtained from the patient's blood. A negative phase is to be avoided at all costs, and in the case of a streptococcal infection a quarter of a million organisms will not be too small for the initial dose. The dose may then gradually be increased every third day, till from two to five millions are being injected. Some prefer to use sensitized vaccines in these cases.

Simple and Immuno-transfusion

Immuno-transfusion, though occasionally attended by brilliant results, is usually disappointing. In carrying out this procedure a donor whose blood is compatible with that of the patient is given a vaccine prepared from the sufferer's organism, or, failing that, a stock homologous vaccine. At the same time the donor may receive an injection of nucleinate of soda, in order to bring about an increase of leucocytes. If the vaccine is injected subcutaneously the immunizing response is generally well established by the end of five hours, after which time the donor's blood is transfused into the patient. It is best not to employ citrated blood. Wright, Stoner, and Colebrook have shown that not only a specific but a general immunity to most pathogenic organisms is developed by the injection of a stock staphylococcic or typhoid vaccine, so that the method can still be utilized in cases in which the infecting organism is unknown.

It has long been recognized that in cases of septicaemia the blood becomes deficient in complement, and simple transfusion of 150 to 300 c.cm. of compatible fresh human serum or whole blood is often successfully employed. In highly febrile cases about the second week of the illness dilatation of the right side of the heart is not infrequent, and as at this stage the transfusion of any large quantity of blood may be attended with danger, it is preferable to administer the donor's serum in small repeated doses.

CADHAM'S METHOD

Professor Cadham of the University of Manitoba has introduced recently a method of treating cases of septicaemia which has yielded striking results. Rabbits six months old are given vaccines of streptococci and staphylococci obtained from cases of septicaemia at certain intervals of time till the age of two years is attained. When such a rabbit is to be made use of in the treatment of a case of septicaemia it receives a vaccine made from the patient's organism. After a short interval 10 c.cm. of blood is taken from the heart of the rabbit by a special procedure which does not entail the death of the animal, and the serum is injected into the patient, who also receives human serum from a compatible donor. A hundred cubic centimetres of blood are taken from the donor, and from four to ten portions of serum from this quantity are injected on alternate days. In Cadham's series of ninety-five cases a mortality of only 10.5 per cent. occurred. As the risk of a fatal termination in septicaemia is usually held to be round about 70 per cent. it is to be hoped that an extensive trial of Cadham's method will be carried out in this country.

AN UNUSUAL CASE

Mention must also be made of an article by Dr. Ronald L. Hamilton in the January (1935) number of the *Guthrie Clinic Bulletin* on the treatment of subacute bacterial endocarditis. He reports two cases of apparent cure following the use of bacteriophage. Space will only permit of a short reference to one of these cases—that of a lady in whom a very virulent subacute bacterial endocarditis developed during pregnancy.

Streptococcus viridans was obtained on blood culture, and petechiae and Osler's nodes were present on the fingers and toes. During the course of the illness sudden and almost complete blindness and left hemiparesis supervened. The Cadham treatment was started, but the reactions were so severe that it was discontinued. Daily injections of from 30 to 50 c.cm. of a 5 per cent. solution of acriflavine for a time led to temporary improvement. Showers of petechiae were of almost daily occurrence, and infarction of the spleen and lungs ensued. On three occasions severe convulsions took place.

In desperation treatment by bacteriophage was decided upon. Following the first treatment the patient developed a temperature round about 104° F., and experienced a severe chill, lasting one and a half hours, but from this time onwards she never manifested any further vascular phenomena. Daily intravenous injections of bacteriophage were continued, each one being followed by febrile reactions and chills of decreasing severity. Blood cultures taken since this time have always proved negative, and at the time the article was written the patient was reported to be attending to her household duties, playing golf, and dancing. Twelve intravenous injections in approximately 2 c.cm. doses were given in all. At first the bacteriophage was diluted with 50 c.cm. of normal saline, and with each successive dose the amount of saline was reduced until the bacteriophage was administered alone.

Treatment with Bactericidal Drugs

Finally, reference must be made to the intravenous use of various bactericidal drugs. It is difficult to believe that a degree of concentration sufficient to destroy bacteria without killing somatic cells can be attained, yet in practice a certain measure of success has followed their use. In a case of the writer's, in which the presence of *Staphylococcus aureus* in the blood stream was attended by a pyrexial illness of many weeks' duration, fever abruptly abated and blood culture became negative after three or four intravenous injections of 10 c.cm. of a 0.8 per cent. solution of collosol iodine given at twenty-four-hourly intervals. Eusol is, as a rule, employed in 0.05 per cent. solution in normal saline, from 200 to 500 c.cm. being injected by the intravenous route. If gentian violet is chosen, from 20 to 40 c.cm. of a 0.25 per cent. solution in sterile tap-water may be prescribed every second or third day for three or four doses. Collosol silver has been administered in streptococcal septicaemia, 5 to 20 c.cm. of a 0.05 per cent. solution being given intravenously on alternate days for a fortnight. Where intramuscular injection is preferred, 1 to 2 c.cm. of a 1 in 2,000 solution of collosol argentum may be substituted. Some cases of staphylococcal septicaemia respond to collosol manganese, in doses of 0.5 c.cm. of collosol manganese (Crookes) by the intramuscular route every third day.

Of the stronger poisons, preparations of mercury and arsenic hold the field. Thus mercuric chloride may be injected intravenously, 3 to 6 c.cm. of a 0.05 per cent. solution being used on alternate days, or even daily, till salivation or some more serious indication of mercurial poisoning arise. Should these occur the drug must be discontinued straightway. Mercurochrome, a compound of mercury and fluorescein, appears to be somewhat less toxic, and 5 to 10 c.cm. of a 0.5 per cent. solution may be administered intravenously to an adult. Some physicians recommend that the drug should be employed in a more exact dosage, stating that the correct dose is 1 to 3 milligrams per kilogram of body weight. An initial dose of 1 mg. per kilo body weight in 0.5 per cent. solution is injected intravenously, and the remedy repeated at intervals of four or five days, the amount being gradually increased till 3 mg. per kilo body weight is reached. Neosalvarsan, of the arsenical compounds, is the one most frequently put into requisition. It is prescribed at weekly intervals, provided there is no renal lesion present, in doses starting with 0.3 gram, but it is disappointing in bacterial infections. Slight improvement sometimes follows administration of sodium cacodylate, 1/2 to 1 grain being injected into the muscles daily for twelve days. Its favourable effect is due most probably to its tonic action rather than to any bactericidal efficacy.

Fixation Abscess

Last of all, another procedure, more often practised in France than in this country, must be mentioned—namely, the production of a "fixation abscess." In a case of puerperal septicaemia which had resisted various forms of treatment, I injected 1 c.cm. of turpentine in the interscapular region; the red, brawny swelling which resulted was incised forty-eight hours later, and hot fomentations were applied. The following day, as no discharge had occurred, a slough which lay between the lips of the incision was gently removed by forceps; its removal was followed by an immediate escape of two or three ounces of pus. Hot fomentations were continued, and the pyrexia, which had lasted four weeks, came to an abrupt termination that same evening. In France a slightly different procedure is sometimes employed—namely, to inject a drop or two only of turpentine in ten or twenty different spots over the abdomen or other part of the body. Turpentine should be avoided if there is reason to believe that the kidneys are diseased.

THE INTERPRETATION OF PAIN IN THE ABDOMEN*

BY

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Pain is the predominating symptom of all acute and many chronic abdominal diseases. In John Hilton's *On Rest and Pain* is found the following paragraph (quoted by Morley): "I conceive that pain situated upon the surface of the body, and associated with some abnormal state of an internal viscus, must be looked upon as a beneficent provision, enabling us by external pain to appreciate slight organic changes or derangements of function of the internal viscera." This conception appears to have met with acceptance without, at that time, arousing any extended scientific inquiry as to the origin and nature of pain. Indeed, the incentive to such an inquiry was lacking, and it was not until Lister had made abdominal surgery possible that the need for an accurate estimation of the meaning of pain became more clearly realized. Lack of time forbids a detailed description of how the present view of the significance of abdominal pain has evolved, but we owe much to Ross and Sir Henry Head, to that great general practitioner Sir James Mackenzie, and, more lately, to Arthur Hurst and to John Morley of Manchester, whose excellent book is a magnificent contribution to the literature of this subject.†

One of the chance discoveries which upset previous views of the meaning of abdominal pain was that the bowel brought out of the abdomen for the purposes of colostomy could be incised without causing pain. A later and more complex observation was that if the abdomen were opened under a local anaesthetic with the patient fully conscious, the abdominal viscera might be freely handled, incised, or pinched without hurting the patient, but that the slightest mechanical stimulation of the parietal peritoneum gave rise to acute localized pain. The viscera themselves are not, therefore, sensitive to the ordinary stimuli which provoke painful sensations elsewhere in the body, including the parietal peritoneum. Pain in the former can only be caused by distension from within their lumen.

Thus we know there to be two types of abdominal pain: (1) that due to distension of a viscus (visceral pain); and (2) that due to irritation of the parietal peritoneum. These two types present marked differences in their mechanism and clinical manifestations. The viscera are supplied by the splanchnic nerves, part of the sympathetic or autonomic nervous system. There is no clear connexion between the splanchnic nerves and the body or somatic nerves, so that pain arising from distension of an abdominal viscus is not accompanied by the physical signs of tenderness of the abdominal wall or muscular rigidity. Moreover, it is not localized, but invariably diffuse and widespread.

Peritoneal pain is something entirely different, and it is this type which led to Hilton's description of "a beneficent provision." Unlike the abdominal viscera, which have a splanchnic nerve supply, the peritoneum is innervated by the body or somatic nerves. The nerve supply is segmental, corresponding with that to the skin and muscles of the abdominal wall. Take, for example, the tenth dorsal nerve. This nerve passes obliquely downwards and forwards from its segment in the spinal cord, first supplying the parietal pleura, and terminates in the abdominal wall in the neighbourhood of the umbilicus. As it passes through the abdominal wall it supplies, over a narrow segment, the skin, muscles, and peritoneum. There is a reflex arc between the peritoneum and parietes, so that if the peritoneum is stimulated in this segment the muscles supplied by the tenth nerve become rigidly contracted, there is superficial tenderness and hyperaesthesia of the skin, and, finally, and of great importance, the pain is accurately and unerringly localizable by the patient to this area.

* A paper read to the Monmouthshire Division of the British Medical Association, February 15th, 1935.

† Morley, John: *Abdominal Pain*, Edinburgh, 1931.

Clinical Aspects of Visceral and Peritoneal Pain

Visceral pain is diffuse, widespread, and the patient cannot localize it accurately. The colic from an overdrastic purgative is illustrative. It is not accompanied by hyperaesthesia of the skin, nor by reflex rigidity of the abdominal muscles. Peritoneal pain is defined, clear-cut, and can be accurately localized by the patient. It is accompanied by tenderness, hyperaesthesia of the skin, and by reflex rigidity of the overlying muscles. Visceral pain is a distension pain, and characteristically it waxes and wanes. Peritoneal pain is inflammatory, fixed, and constant, steadily increasing in intensity.

In visceral pain the temperature is unaltered or subnormal ; in peritoneal pain it is raised. The decubitus of the patient is illuminating. Contrast the restlessness of the subject of visceral pain with the repose of the patient suffering from inflammation of the peritoneum. The one rolls about in a frantic endeavour to gain ease: the other remains motionless with his knees drawn up, fearful lest any movement should aggravate the exquisite pain. Biliary colic may be distinguished from a perforated peptic ulcer by these manifestations alone: a distinction of the greatest moment, for the immediate treatment of the one is morphine, and of the other, operation.

Some Common Complaints and the Pain they Produce

APPENDICITIS

Acute appendicitis clearly deserves pride of place in this connexion. What is the sequence of events in a typical case? First there is central abdominal pain—a stomach-ache—diffuse, spreading widely around the umbilicus, colicky in type, and increasing in severity. This is visceral pain. It is due to distension of the appendix (which, being embryologically a midline structure, has a bilateral splanchnic nerve supply) by inflammatory exudates or by the presence of a concretion. There are no physical signs. After a varying period—in the more virulent infections of a few hours' duration only—pain starts in the right iliac fossa. It is constant and localized, and due to irritation of the parietal peritoneum. There is hyperaesthesia, local tenderness, and rigidity of the abdominal muscles. The temperature begins to rise. With such a history a diagnosis of acute appendicitis can be made with absolute certainty. There is, indeed, no differential diagnosis.

Unfortunately, the reverse is not true. If this sequence of events is not followed acute appendicitis cannot be excluded. Though the central abdominal pain is always present, unless the appendix has been disorganized by a previous attack the peritoneal type of pain may be lacking, and this is because the appendix lies posteriorly and the peritoneum is protected from it by the caecum and ascending colon. The retrocaecal appendix is common in children, and constitutes one reason why in almost every case of appendicitis in childhood the appendix has perforated before the diagnosis is made.

A second instance, in which it may be said of the appendix that it does not play the game strictly according to the rules, is when it lies wholly within the pelvic cavity. The peritoneum lining the pelvis is situated too low for it to be segmentally represented by muscles, and in pelvic appendicitis the physical signs of tenderness and rigidity of the abdominal wall are sometimes lacking. In both retrocaecal and pelvic peritonitis, however, we are provided with a way out of the difficulty. In the former case the close contact of the inflamed appendix with the psoas induces spasm of that muscle with flexion of the right hip-joint in consequence, and in the latter case there will be tenderness on rectal examination.

BILIARY COLIC AND CHOLECYSTITIS

Pain may arise from within the biliary tract during the attempted passage of a gall-stone from the gall-bladder, or from acute inflammation of the gall-bladder itself. Biliary colic is a true visceral pain, situated diffusely to the right side of the umbilicus. In its early stages there is no localized rigidity—in one case I was able to feel the enlarged gall-bladder during the attack—though peritoneal pain may develop later as a result of oedema of the gall-bladder wall. Rarely, an attack of biliary colic may terminate in gangrenous cholecystitis, and all the physical signs of localized peritonitis be present in marked degree.

In cholecystitis the pain is almost entirely of the "peritoneal" type, and thus tenderness over the gall-bladder with hyperaesthesia of the skin and rigidity of the muscles are found on physical examination. "Shoulder-tip" pain is also a frequent accompaniment, but is not the prerogative of cholecystitis, for it may occur in any condition in which the peritoneum related to the diaphragm is stimulated—for example, in perforation of a duodenal ulcer. The pain results from the fact that the phrenic nerve, which supplies the diaphragm, arises from the fourth cervical segment of the spinal cord, from which arise also the descending cervical cutaneous nerves supplying the shoulder.

PEPTIC ULCERATION

The pain of chronic peptic ulceration of the stomach and duodenum is still very little understood. It is unquestionably visceral, but there is some doubt as to whether it arises as the result of muscular contractions of the stomach and duodenum in the presence of an ulcer, or whether it is due to the irritant action of the gastric juices upon the ulcer. Both may play a part. The most striking character of peptic ulcer pain is its relation to food. In uncomplicated gastric ulcer the pain, which is of a "boring" character, develops half an hour to one hour after a meal, but disappears before the next meal is taken. In duodenal ulcer the pain, which is of a burning character, arises some two hours after meals and lasts until the next meal, which itself gives relief. The cycle, meal–freedom–pain–freedom–meal, true of gastric ulcer, is thus contrasted with the cycle characteristic of duodenal ulcer, meal–freedom–pain–meal–freedom–pain. In the former the rhythm is quaternary, and in the latter, tertiary. Localized tenderness and, in some cases, increased resistance of the muscles may be present during the active phase of an ulcer. Morley suggests that this is due to contact of the ulcer with the parietal peritoneum owing to the pressure of the examining hand.

Perforation of a gastric or duodenal ulcer is heralded by violent pain of the visceral type of short duration, which subsides immediately perforation into the general peritoneal cavity takes place. For a time, while the patient is collapsed and during this quiet interval, pain in the abdomen may not be very marked. The quiescent period soon passes, and pain of the peritoneal type in its severest form develops. It is due to stimulation of the parietal peritoneum by the highly irritant secretion of the stomach or duodenum. At first localized to the epigastrium, it spreads downwards until it is diffused over the whole abdomen. During this stage the abdomen is retracted as a result of the board-like reflex rigidity of its muscles. Shoulder-tip pain is not infrequent in duodenal ulcer perforation, and is due to the duodenal contents forming a collection underneath the diaphragm.

Pain resulting from acute pancreatitis is of the visceral type, and is due to distension of the pancreas as a result of the enormous swelling of the gland. There is no rigidity of the abdomen even when the pain is most severe, and the swollen pancreas may be felt, unless the patient is a fat subject. The severe pain, which is said to be the most exquisite pain from which man can suffer, is accompanied by vomiting of an intractable type, with cyanosis of the extremities and rapid dehydration.

PAIN FROM THE SMALL INTESTINE, KIDNEY, ETC.

Pain arising from the small intestine is familiar to us all—the ordinary colic from excessive stimulation of the musculature by some error in diet or from a cathartic. The pain resulting from organic obstruction, such as an internal or an external strangulated hernia, is of the same character, but, of course, severer in degree, of sudden onset, and associated with sickness and distension of the abdomen. In obstruction due to some internal derangement or abnormality, such as a persistent Meckel's diverticulum, there are no accompanying physical signs, and the diagnosis is extremely difficult. Sir Watson Cheyne's dictum—operate if the pain is persistent and severe—is worthy of attention. In young infants we are sometimes at a loss

to assess the severity of the pain, as the child cannot help us. The screaming attacks which accompany the violent contractions of the bowel in intussusception are, however, characteristic, and if blood is passed per rectum or a tumour felt in the abdomen the diagnosis is assured. It is frequently difficult in the child to distinguish between true reflex rigidity of the muscles and voluntary rigidity; hence the need for examining the child suspected of an intussusception, in which there is no true rigidity, between the attacks of pain.

The pain excited by the passage of a renal stone is of the true visceral type; it differs, however, from intestinal colic in that its localization is more accurate, although as the pain increases in severity it radiates diffusely. There may be a little tenderness over the kidney region during the attack, and the lumbar muscles may be a little more resistant than normally, but there is none of the reflex rigidity characteristic of peritoneal inflammation.

Thus far I have reviewed only conditions inside the abdomen that give rise to pain, but those extra-abdominal conditions in which pain is referred to the abdominal wall need mention. Everyone is familiar with the abdominal pain sometimes present in the early stage of pneumonia, which may suggest a diagnosis of appendicitis, especially in the child. The distribution of the pain is due to the fact that the lower dorsal nerves supply both the parietal pleura and the abdominal wall, as has already been pointed out. There is little rigidity in these cases, and the pain over the abdomen is widespread. There is, of course, no antecedent visceral pain so characteristic of appendicitis.

Herpes, Pott's disease of the spine, and tabes dorsalis are conditions in which pain may be referred to the abdomen as a result of changes in, or pressure upon, the posterior roots of the spinal nerves. In none of these is there any rigidity of muscle or deep tenderness, although, especially in herpes, there may be marked hyperaesthesia. I suppose that we have all ingrained in us the habit of testing the knee-jerks in cases of acute abdominal pain, where the origin is obscure.

OSTEOPATHS BILL: SELECT COMMITTEE

TENTH SITTING

Conclusion of British Medical Association Evidence

The House of Lords Select Committee on the Registration and Regulation of Osteopaths Bill sat again on Friday, April 5th, to hear the conclusion of the evidence of the British Medical Association against the Bill. Lord Amulree presided.

Mr. Thorpe, K.C., for the applicants, handed to their lordships a volume of 368 pages which had been prepared in the last eight days by Dr. W. Kelman Macdonald of Edinburgh, entitled "The Scientific Basis of Osteopathy." It embodied the seven Bulletins of the A. T. Still Research Institute, which have figured so prominently in the hearing, and some two dozen selected contributions to the *Journal of the American Osteopathic Association* by various osteopathic research workers, but in Dr. Macdonald's foreword it was stated, "Practically the whole of this book is a presentation of the work of Louisa Burns, M.S., D.O." In the same foreword Dr. Macdonald combated Sir Henry Brackenbury's evidence: "It only goes to show that Sir Henry Brackenbury does not know what osteopathy is. How many more times have we to point out that manipulative surgery is not osteopathy?" Mr. Thorpe said that the book was inspired by Lord Dawson's invitation to produce any scientific basis available.

Evidence by Sir Morton Smart

Sir Morton Smart of Park Lane, London, late medical officer in charge of the electrical department, Hospital for Sick Children, Great Ormond Street, was the last witness called by the British Medical Association, and was examined by Mr. Dickens. He said that he had a very large practice in manipulative surgery, which was a valuable method of treatment in certain cases. Those who undertook it should understand the scientific basis on which it had been developed, including a wide knowledge of anatomy, and a knowledge of normal joint movement and of pathological conditions. Manipulative surgery, like all other methods of treatment, must be preceded by a skilled diagnosis. While of great value in certain cases it could, in others, do great harm. Commonly it was employed in association with other treatments or as a preliminary to them. In general it dealt with local conditions of bones, joints, and muscles, including conditions involving impairment of mobility and displacement of structure. There were many pitfalls which could be avoided only by a sound knowledge of medical science and by experience. The value of manipulative surgery as a method of treatment was widely recognized by the medical profession. To apply it indiscriminately was unscientific, and results might be helpful, useless, or positively dangerous, according to the nature of the case.

The witness said that he had studied the literature of osteopathy and did not believe in its theory, for which he found no scientific evidence. "If the theory were true, the number of people in the world who are suffering from diseases and disabilities must be so great that it would be impossible not to prove its truth." He agreed on counsel's further questions that it was clearly demonstrable that the claims of the osteopaths in regard to infectious diseases were without foundation. He explained that he used the word "osteopathy" in the sense of its practice as equivalent to "manipulative surgery." It could be clearly shown that its admitted usefulness in certain cases was based on well-known pathological facts.

We have heard that the theory of osteopathy has grown considerably since the days of Still?—Yes.

Has osteopathy been more and more willing to adopt other such therapeutic agents as are used by the medical profession?—There is overwhelming evidence, both in America and this country, that osteopaths, while trying to adhere to the original theory of Still, have ventured far from that theory, and now embrace practically every method of treatment known to scientific medicine.

What do you deduce from that as to the value of the original theory?—That the osteopaths themselves have realized that the original theory cannot possibly account for the causation of all diseases, and therefore that in treatment under the name of osteopathy they have taken over every method they can lay their hands on in order to get a result.

Counsel put to the witness certain quotations from osteopathic authorities bearing this out. One was from Still himself, in the *Journal of the American Osteopathic Association* in 1913, when he said there was "an alarm at the door of all osteopathic schools. The enemy have broken through the picket." Another was from N. J. Macdonald, president of that association, 1929–30, in which he complained of current qualifications of osteopathic doctrine. A third was from R. B. Gillman, chairman of the Bureau of Professional Education of the American Osteopathic Education, who, in 1928, wrote that

"two State societies have passed resolutions urging the incorporation of materia medica in the standard curriculum of the colleges of osteopathy. In direct opposition to that several State associations have adopted resolutions severely censuring such an attitude, and commending the colleges and trustees of the American Osteopathic Association for their stand on this matter. The chairman submits the opinion that those societies urging the inclusion of the subject in the curriculum have not sufficiently studied the inevitable result should it become a part of the course in our colleges. There could be no other result than the obliteration of the distinctive osteopathic school of the healing art through absorption. No better weapon could be placed in the hands of the allopathic school than the teaching of materia medica in our colleges."

Mr. Thorpe, for the applicants, said that surely the only inference from all this was that these gentlemen said, "Let us hold to our truths. If we dilute them we shall be merged in orthodox medicine."

The Supposed Public Demand for Osteopathy

Sir Morton Smart, in reply to a further question, said that if any body of practitioners was to be allowed legally to treat the sick, whatever the method of treatment, it seemed unanswerable to him that they should pass the minimum standard of the medical colleges.

Mr. Dickens: One of the chief reasons given for this Bill was that the public demanded osteopathy. On what does the success of a new theory of healing depend for its popularity?—The success of any form of treatment so far as the public are concerned is due to the fact that the public do not inquire carefully enough into cause and effect. Most people are liable to think that a treatment is a good one because they know of a case in which it has been successful; but they do not go into the question of cause and effect. A number of people have been successfully treated and they create the *vox populi* in favour of the treatment, but the very large number with whom the treatment has not been successful are overlooked.

Lord Elibank said that the same argument would apply to cures by doctors, and the witness agreed. Lord Dawson said that a series of isolated successes was not good evidence for the establishment of any treatment. The proof as to whether a treatment was successful or not could only be afforded on the lines of scientific method, with marshalled cases and controls. That applied to any treatment.

Sir Morton Smart said that decidedly the cures in osteopathic cases were isolated. It was a certain kind of case which responded to osteopathic treatment.

Mr. Dickens: What do the generality of the public understand by osteopathy?

Mr. Thorpe: Is this witness entitled to speak on behalf of the generality of the public and the state of their minds?

Mr. Dickens: Then I will ask it in this form—What do the general public as far as he comes into contact with them think osteopathy means?

The Chairman: Is that of great importance in this inquiry? I am not quite sure that I see the relevance of this.

Mr. Thorpe: I have never put it higher than that there is a public which wants osteopathy.

Sir Morton Smart, in reply to further questions, said that the results of osteopathy or other forms of treatment might be divided into five main groups: temporary cures; cures coincident with or in spite of treatment; actual cures; failures; and cases in which material harm resulted. He could give examples under each of these headings. In the case of temporary cures there were countless examples throughout the whole field of medicine and surgery to prove that the symptoms of many diseases underwent periods of remission as a natural result of the progress of the particular disease. Sometimes there was temporary or periodical improvement resulting from such factors as change of air, faith in a particular treatment, and the reaction of the patient to encouragement. If osteopathic or other treatment took place *pari passu* with such remission of symptoms from whatever cause the patient naturally attributed the result to the treatment and talked enthusiastically of its success.

Cures coincident with or in spite of treatment embraced an enormous number of apparent successes. A frequently recurring example was "water on the knee," in which the knee-joint was filled with fluid as a result of non-use or slight injury. In the great majority of cases such a condition so far as the presence of fluid was concerned would clear up in from six to ten days, even if no special treatment was prescribed. But if such a patient underwent osteopathic treatment, and it was explained that a bone, muscle, or ligament in the spine was out of place, and that cure of the knee condition was dependent on such replacement, it was little wonder that the patient believed the diagnosis of misplaced structure when the fluid, which from his point of view was the main symptom, disappeared.

Harm Done by Osteopathic Manipulation

The witness said that there was indisputable evidence that harm might be caused by osteopathic manipulation, not merely by ill-directed manipulation, but by waste of valuable time following wrongful diagnosis and treatment. There had been a large number of cases where osteopathic manipulations had resulted in damage to the soft structures. He quoted from the *Practice of Osteopathy*, by McConnell and Teall, to the effect that in the treatment of all dislocations, partial or complete, the first technique was to exaggerate the dislocation. This seemed to him a surprising procedure. If one was trying to reduce the dislocation of a spinal vertebra, one of the most essential things was not to exaggerate it, because of the danger of further pressure on the cord.

With regard to dangers consequent upon the waste of valuable time, he knew of three cases in his own experience in which, had not time been wasted by unavailing osteopathic treatment, there would have been a great chance of success by more suitable methods. He also referred to the psychological effect on the patient on being told that, for example, a hip was misplaced, and he mentioned one case within his experience in which an osteopath, quite wrongly, had told a girl who was about to be married that her pelvis was so contracted that it would be dangerous for her to have children. When the case came to him he pointed out that the best way to proceed would be to have an *x*-ray photograph taken, and on this being done it was shown that there was no contraction of the pelvic outlet.

Asked why in his view a State register should be denied to osteopaths, Sir Morton Smart said that it was not in the public interest that State registration should be given to a group of practitioners who based their practice on a theory unsound and unscientific. If the Bill were passed it meant that in the opinion of those responsible for its passing the foundation principles of osteopathy were admittedly true, in spite of the overwhelming evidence of the medical profession and of the scientific world. The natural corollary would be that medical and surgical treatment as practised to-day in all civilized countries should be prohibited in the public interest. If State registration were accorded on the ground that the public were using osteopathy, then it would be impossible to deny registration to any and every cult that could find popularity. Chiropractors, nature curers, and Christian Scientists commanded as large a public as osteopaths. He also drew attention to the class of persons who would come on to such a register. It would be intolerable that diplomates from the British School of Osteopathy should be on a State register. As for those who had American degrees, no American degrees in medicine were recognized for the *Medical Register* in this country, and it would be absurd to recognize for the purpose of the osteopathic register qualifications which were of a lower standard and different quality from American medical degrees.

In conclusion the witness said that his opposition was not in any way dictated by fear of consequences to himself or his fellow practitioners. It was often said that medicine resisted the registration of osteopaths because it feared the competition that would follow if they were given legal status. "Whatever may have been the sins of omission and commission of medicine in the past, modern medicine is eagerly ready to receive with sympathy any improvement in technique and treatment and new ideas in pathology, provided they are honestly proclaimed and scientifically proved, although it may do so with slowness and caution."

Cross-examination of Sir Morton Smart

Mr. Thorpe prefaced his cross-examination by saying that the witness had mentioned the British School of Osteopathy. Those for whom he appeared were under no delusions in that matter. Dr. Macdonald had said that he did not regard the standards of the school as satisfactory. Turning to the witness he said that on many occasions his name had been mentioned in association with that of Dr. James Mennell. He and Dr. Mennell were practising the same technique? The witness replied that Dr. Mennell practised in other branches than pure manipulative surgery; he used such treatments as infra-red and ultra-violet, which the witness did not. He agreed that Dr. Mennell and himself could fairly be regarded as exponents of manipulative surgery. He was asked whether he agreed with Dr. Mennell's statement in a letter read at the previous hearing, that while orthodox medicine had a useful and invaluable purpose to serve, the less orthodox methods had no less their own sphere of usefulness, and until the two were combined they would neither of them rise to perfection. Sir Morton Smart replied that he would assent to the proposition if, in contrasting orthodox medicine and osteopathy, "manipulative surgery" were substituted for the latter term. The practice of osteopathy, not the theory, was manipulative surgery. He agreed that manipulative surgery was now well recognized in medicine. The prejudice of the medical profession in former years had had to be overcome, but things were quite different to-day. Mr. Thorpe put to the witness the definition of osteopathy in the Bill:

"Osteopathy means that system of the healing art which regards the structural integrity of the body mechanism as

being the most important single factor to maintain the well-being of the organism in health and disease."

The witness said that that related to the theory of osteopathy; what they were now talking about was the practice.

So far as practice is concerned there is little if any difference?—From the point of view of the practice of the art there is little or no distinction between the osteopath and the manipulative surgeon.

You have spoken of a "qualified osteopath." What is a qualified osteopath?—I should say Dr. Macdonald is a qualified osteopath.

Do you object to the practising of people whom you regard as qualified osteopaths?—Do you mean doctors who are practising? Certainly not.

What you object to, both in theory and practice, in a man without a medical degree is condoned as soon as he takes a medical degree?—Not by any means. It is a question of skill.

Dr. Macdonald qualified in America as an osteopath. Do you regard what he is doing as quite innocuous?—I object to the theory of osteopathy.

Dr. Macdonald accepts the theory.—And I disagree with him.

Does not the theory influence the practice?—No, I do not agree with that.

If the theory does not influence the practice, what harm can there be in osteopaths carrying on their practice, the practice being so similar to that of manipulative surgery?—I think there is every reason.

Well, I do not appreciate it. The quotations which have been read this morning only show the loyalty of osteopaths to their beliefs?—Yes.

Is that a thing you deprecate?—No.

The witness was asked how many medical schools were definitely teaching manipulative surgery. He replied that he thought all schools taught it; manipulative surgery was taught in the orthopaedic departments. Mr. Thorpe thereupon remarked that it was curious that in the resolutions of the General Medical Council which came into operation on January 1st, 1923, with regard to professional education, manipulative surgery never appeared. Sir William Jowitt said that Sir Norman Walker, president of the General Medical Council, would give evidence.

Re-examination

In reply to Sir William Jowitt, the witness said that so far as he knew in this country the practice of osteopathy was limited to manipulative surgery; in America it extended over a much wider field. Asked whether on the theory of orthodox medicine he could explain why in a large number of cases manipulative surgery was a good treatment, he said that principally the type of case that did well was one in which there was limitation of joint movement due to adhesions or to affection of the areolar tissue so that resiliency was lost. There were also, of course, the cases of dislocation. In the correct type of case manipulative surgery was the only treatment.

Do you think it can do any good to a person suffering from measles?—I think it fantastic.

Or pneumonia?—Equally.

Have you a very large number of patients sent to you by ordinary medical practitioners?—Yes.

Have you any doubt that to-day the value of manipulative treatment is fully recognized by the medical profession?—Most decidedly it is recognized—since, practically, the war. From that time onwards manipulative surgery has increased unbelievably.

In reply to Lord Dawson, the witness agreed that the production of individual successes and failures could serve no useful purpose, whether in medicine, or osteopathy, or herbalism, or anything else. He agreed also that there was such a thing as bad manipulative surgery, comparable with bad osteopathic manipulation. The harm done might arise either from faulty diagnosis or faulty technique.

Lord Elibank said that the name of Sir Robert Jones had been mentioned, and he asked where Jones first got his idea of manipulative surgery. The witness believed that Jones got it from a bone-setting connexion, as he himself did. That was long before osteopathy ever came to this country.

Dr. Mennell told us that in his opinion manipulative surgery was not a craft, but based on scientific thought and observation. Do you agree with that?—Yes, I think I do.

He also told us that the practice of osteopathy was identical with manipulative surgery?—That is absolutely my view.

Therefore you would agree that osteopathy is based on scientific thought and observation?—No, because osteopaths have built up a pathology which in my view does not exist.

You have not a prejudice against the word "osteopath"?—I think it is a horrible word.

And that is the reason why you will not admit the theory?—No, I have a definite reason for not admitting the theory.

Well, it is incomprehensible to me that as you have admitted that osteopathy and manipulative surgery are one and the same thing, yet manipulative surgery is based on scientific thought and observation and osteopathy is not.—If you have your leg manipulated by an osteopath, and I manipulate the leg in exactly the same way, I have a reason in my mind for doing it which is quite different from the osteopath's.

The theory is different, but the result is the same?—The result ought to be the same if the case was one in which manipulations were called for.

Lord Marley asked the witness whether it would not be advantageous if those who had been his patients came to him periodically for examination, and possibly manipulation, with a view to preventing illness. The witness replied that manipulation would not prevent the onset of pneumonia or diphtheria. Lord Marley mentioned the psychological effect, but the witness said that no psychological effect of preventive treatment would stop infection, though he agreed that a person in a good state of health was less likely to contract disease. Asked whether there was any human being who was structurally perfect, he replied, "Certainly not." Lord Marley remarked that many people in that room, to judge from their sitting attitude, would benefit by manipulation, but the witness expressed the view that it was too late for a great many of them. He also mentioned that most osteopaths had bent backs, probably the result of their job. In the course of some further exchanges the question of typhoid was mentioned, and the witness compared the incidence of typhoid in the Crimean and South African Wars and in the European War, and asked whether it was conceivable that all the vertebral joints were out of place in the two earlier wars and not in the more recent war. Lord Carnock said that he thought witness would agree with him that to kill flies was more likely to prevent enteric than to manipulate people's backbones.

The Chairman asked the witness's opinion of the five years' training proposed in the Bill. The witness replied that its value depended on the character of the schools as well as the length of the training. Even if the training were ten years it might not give the necessary equipment for diagnosing and treating disease. He mentioned the great advantages of the medical schools attached to the universities, their laboratory equipment, and the money available. No university in this country could be run on the fees of students. It seemed to him that an osteopathic college could be nothing but sub-standard in comparison, even if the curriculum extended over twice as long. He agreed that an osteopath who had a certain minimal standard of medical education, and limited himself in his osteopathic treatment to the type of case where manipulative surgery was useful, might do good work, but he was against a register of osteopaths even with such limitations, because if there was a register for them there seemed no reason why a register should be denied to any healing cult.

Would it not be better to have a register of osteopaths who have received a certain training than to have people setting up as osteopaths without any training whatever?—If you registered the osteopaths you would have no power to prevent anybody else from doing osteopathic treatment provided they did not call themselves osteopaths.

Surely the public would know?—These people have only to call themselves something else. They can join the chiropractors.

This concluded the case presented against the Bill by the British Medical Association.

Sir Farquhar Buzzard: Supplementary Evidence

Sir Farquhar Buzzard returned to the witness-chair to complete his evidence given on March 25th (*Journal*, March 30th, p. 664). He was now represented by Mr. Radcliffe, K.C. He desired to remind their lordships that anybody who

claimed some scientific recognition must submit certain prima facie evidence. In the present inquiry, so far as he could gather, the only response to this requirement had been the volumes of the A. T. Still Research Institute. His own personal inquiries into the scientific value of the evidence had led him to conclude that it did not afford the necessary prima facie proof, and on the previous occasion he had given instances in support of that view. With regard to the volume just presented by Dr. Macdonald, he had glanced only at the section dealing with the brain, but here there were none of the illustrations so important in Yale Castlio's book, to which he had drawn attention on the last occasion, and which let down the whole thing, showing that changes in the structure were not properly recognized.

There was another aspect (Sir Farquhar Buzzard continued) of this question of scientific investigation. Medicine was international, and workers in every civilized country were always on the alert to investigate anything likely to throw light on obscure problems of disease. If anything of that kind was discovered it was at once disseminated throughout the scientific world. It had been claimed that manipulation of the spine would prevent and cure all diseases. If true this would constitute the greatest medical discovery of the age. The whole medical profession would welcome it with open arms as they had done other great discoveries. Osteopathy had been before the world for fifty years, and American scientists had had by far the best opportunity of judging its claim as a scientific system of medicine. They had listened to the boast that osteopathy was a curative and preventive panacea. They had had osteopathic schools and hospitals in their midst. But what was the position? Every medical man in America—a country which had been the birthplace of many scientific discoveries—repudiated the osteopathic creed, and was ashamed that his country was the happy hunting-ground of these cults. Thousands of post-mortem examinations all over the world were conducted with the one object of finding abnormalities, and it was inconceivable that the osteopathic lesion should escape observation if, as osteopaths claimed, it was present in every patient. The witness personally had carried out hundreds of such examinations, devoting special attention to the spinal column and cord, and had never found anything which he could recognize as the osteopathic lesion. They had heard from Dr. Littlejohn that in the British School of Osteopathy there was something called a pathological laboratory, but it did not possess a single museum specimen illustrating the lesion. It had ten thousand microscope slides illustrating the pathology of disease, but not one could be presented as exhibiting such a lesion—an astounding admission for anyone to make who advanced claims as to the scientific basis of osteopathy.

A Menace to the Prestige of Medicine

Finally Sir Farquhar Buzzard desired to explain what he meant when he had said at the previous hearing that this Bill was a menace to the prestige of this country in retaining sanity of outlook in dealing with the problems of medicine and science. This country had wisely refrained from interfering by legislative action with the right of any individual to practise any system of the healing art, and had contented itself with affording the public information in regard to what in the eyes of the State constituted an adequate training for the practice of medicine. For many years, too, Great Britain had held its position in the forefront of medical progress, and those best qualified to judge what that position really meant contemplated with the gravest misgiving the effect which the passage of this Bill would have in other countries. America was a young country, and only lack of experience allowed its individual States to be rushed into taking very unwise and confused legislative measures in regard to the various healing cults. They had done it in haste and had been repenting at leisure. For Great Britain with its great traditions to follow the example of the United States in recognizing these evanescent cults would undoubtedly make us a laughing-stock of the nations.

The witness took up a point which had been made by Dr. Macdonald regarding the injustice of expecting a student who wanted to go in for osteopathy to undergo medical training. He paralleled it with the case of a student who intended motor engineering as his profession, but believing that all troubles with cars were due to water in the carburettor, complained that there was no school where he could be taught that alone. Orthodox medical education was of the widest kind, adapting itself to new occasions, and not, like osteopathic teaching, bound to a narrow creed.

Cross-examination of Sir Farquhar Buzzard

Sir Farquhar Buzzard was then cross-examined by Mr. Thorpe, K.C. Referring to the proposal that there should be a registered medical practitioner, appointed by the General Medical Council, on the Board proposed in the Bill, the witness said he did not think that would be desirable, and personally he would not care to act in such a capacity, nor would he take any steps to assist or encourage osteopaths if they obtained statutory recognition. He was thinking solely of the interests of the public.

In reply to questions as to the statement he had handed in, signed by teachers of the biological and medical sciences, the witness said it had been sent to the deans of the various medical faculties with a covering letter, written by himself, asking the deans to submit it to the teachers in their faculties. It was left to them to approach the members of their staffs, who would sign it if they thought fit. He agreed that the statement had not been signed by all the teachers, but said it would be wrong to state that the majority had not signed. The matter had had to be carried through in a great hurry.

Counsel quoted the following paragraph in the statement: "In the laboratories of the universities workers are constantly engaged in the examination of current doctrines and theories and in the testing of new propositions," and asked the witness whether the theory and practice of osteopathy fell under any of those categories—current doctrines, theories, and new propositions. The witness replied that it might be regarded as a current doctrine. He did not think it had ever been subjected to research in any university laboratory, for the reason that there was no prima facie evidence making it worthy of prolonged investigation. He agreed that hundreds of his own patients went to osteopaths and that it might be inferred that hundreds of other doctors' patients also went to them; he also agreed that osteopaths had brought some benefit to suffering humanity, but he did not think that was prima facie evidence that there was anything in the doctrines propagated by osteopaths. The subject of osteopathy had been studied by scientific medical people in America, who had had the matter before them for the past fifty years, and if they had found anything in the osteopathic creed it would have been accepted long ago all over the world, medicine being not national but international. He did not agree with counsel that it was the duty of research workers in this country to investigate osteopathy for the purpose of demonstrating to the British public that it was founded on a false conception; it was the duty of people who brought forward a new theory to provide some material which was worthy of investigation. About eight or ten years ago he had attended a meeting of a clinical club composed of physicians on the staffs of various London hospitals when a medical man who had taken up osteopathy put forward his theories and demonstrated his methods. He had not been convinced by the demonstration or by the statements made by the doctor on that occasion.

The Theory of Osteopathy and Scientific Evidence

Counsel quoted another paragraph from the document, as follows: "The theory of osteopathy, with its conception of the osteopathic lesion as the primary cause of disease, is unsupported by scientific evidence," and asked the witness where he had obtained the statement that osteopaths regarded the osteopathic lesion as the primary cause of disease. The witness replied that he had known of osteopathy for many years, and the source of his information must be regarded as his general knowledge.

Counsel said that the statement continued: "No biologist, anatomist, physiologist, or pathologist of a British university has observed this osteopathic lesion," and asked if any of those gentlemen had looked for it. The witness replied that they had and that he had looked for it himself. He had had a general idea of what he had been looking for. In the theory of osteopathy the amount of displacement of vertebrae had been altered from time to time; in the early days it was

complete displacement, whereas now it was called maladjustment. Such things could be quite easily verified by a post-mortem examination. With regard to the soft tissues, osteopaths referred to the muscles, ligaments, and so forth in the neighbourhood of the spinal column, saying that there was often oedema, tenderness, and so on. That was the kind of thing which would be very obvious.

Referring to a statement in the document that "there can be no compromise; the theories of medical science and of osteopathy are incompatible and contradictory," counsel asked the witness if he had heard the evidence of Dr. Mennell, Sir Morton Smart, and Sir Henry Brackenbury. The witness replied that he had, and he agreed that those gentlemen thought there was something in common in the practice of osteopathy and in the practice of manipulative surgery, but he still considered that there could be no compromise and that the theories of medical science and osteopathy were incompatible and contradictory.

Counsel then asked the witness why he considered that the practice of osteopathy was dying out in America, pointing out that the witness had merely referred to a book by Professor Haggard, published six years ago in America, and to the impression he had obtained from conversations he had had with various people in America. The witness replied that he had satisfied himself as to the truth of the statement and he had not inquired as to whether there were any statistics that would confirm it.

The witness agreed that as soon as a man took a medical degree he could practise osteopathy with impunity, but it could not be said that in no case would such a man lose caste in the eyes of other qualified medical practitioners; one could not make a generalization on the subject. He thought that in the public interest it was not desirable that anyone should practise osteopathy. The practice of medicine did not consist of treatment only. There was first of all the question of diagnosis, and, secondly, the question of what was the best thing to do for a patient. The most important matter was the question of diagnosis. He objected to anyone practising who approached a patient with the view that his trouble must be primarily due to a displaced vertebra.

Questioned by counsel as to whether he had taken any further steps to investigate the subject of osteopathy since he had attended the demonstration eight or ten years ago to which he had referred, the witness said that he went into the matter again two or three years ago, when the question of a royal charter was brought forward. He had then read some papers on the subject, but he did not derive from them any information which led him to think any more highly of osteopathy than he had thought before.

Counsel pointed out that Sir Henry Brackenbury had made the following statement to the committee: "During the last fifty years of the medical profession, speaking broadly, over the whole field, I have no doubt whatever that there has been too much drugging and too little manipulation, and, in so far as the increasing recognition of the importance of manipulation and the increasing recognition of the limitation in the use of drugs is concerned, I should like to give the osteopaths every credit for having emphasized these," and asked the witness whether he thought that any credit was due to osteopaths for their emphasis of those two points. The witness replied that it was very difficult to say, but he thought Dr. Mennell was undoubtedly right in stating that osteopaths had something to learn from doctors and doctors something to learn from osteopaths. He would pay a slight tribute to osteopaths for the part they had played in bringing in manipulative surgery, but he thought the bone-setters really should have the credit for that in this country.

Mr. Thorpe: If the osteopaths deserve slight credit for what they have done in the past, why do you conclude that their capacity for bringing benefits has ceased?—It is quite impossible for any benefit to accrue in increasing quantity from people who practise medicine and who are not properly qualified and have no knowledge of the basic foundations of medicine.

Re-examination

The witness was then re-examined by Mr. Cyril Radcliffe, K.C. He said that, holding the views he did hold as to the osteopathic theory, he did not think he could give any valuable service on such a Board as the Osteopathic Board proposed in the Bill.

Mr. Radcliffe: Do you think that any medical man holding the same views as to the osteopathic theory that you hold could give any valuable service at all on such a Board?—No. My objection is from the point of view of the public. I think it would be extremely wrong in the interest of the public for the Board to contain medical men recognizing osteopathy. The establishment of such a Board means, as far as the public is concerned, that this is another kind of doctrine which the State regards as equally safe for anybody to submit himself to; it suggests that people would be as safe in going to an osteopath as in going to a medical man, and to my mind that is a very serious thing

With reference to a paragraph in the statement he had put in, as to workers engaged in laboratories in the examination of current doctrines and theories, the witness agreed that the purpose of such workers was to ascertain whether the doctrines and theories which they investigated could be scientifically justified or not, and they did not engage in research work for what might be called propaganda purposes. If they heard of a theory which they regarded as unscientific they would not consider it their duty to engage in research work on the subject.

Lord Esher: However dangerous it was to the community?—No, they would not regard it as their function. It is the business of people who put forward a theory to supply some scientific evidence of its value.

Lord Esher: Dr. Macdonald said he had endeavoured to get his theories examined, and was ready to produce evidence in favour of them, but the medical research people had always refused to examine his evidence.—I know that Dr. Macdonald has talked to medical societies. He has had an opportunity of putting forward in a categorical way the evidence which he considers is scientific evidence.

Lord Elibank: Yet the medical societies have not thought it worth while to pursue the subject?—Having heard the evidence, no.

In spite of the fact that there are osteopaths practising all over the country and that the public are going to them in hundreds of thousands? Is not that wrong?—Why is it wrong?

Lord Esher: Because you maintain that they are a danger to the community. What is scientific research for except to protect the community?—Knowledge.

You really mean it does not matter what happens to the community?—It seems to me perfectly clear. We could not have, as some countries have, legislation against anybody practising the healing arts who is not qualified. As the law stands at present, there is no legislative action against anybody practising the healing art. We cannot protect the public in that way. They will go to the practitioners of any and every cult. They have done so since the world began and they will go on doing it. But in that way they take their own risk. The public know where they can go to obtain the services of qualified medical men. They can go anywhere else they like.

Referring to the statement that osteopaths conceived the osteopathic lesion to be the primary cause of disease, counsel quoted passages from the opening speech on behalf of the promoters of the Bill and from the evidence of Mr. Streeter, which the witness agreed supported the statement. The witness also agreed that in referring to osteopathy as being a dying cult in America he had stated that that was his impression; he would not have said that if he had been making a statement based on statistics.

Medical Investigation of Osteopathy

Lord Esher then questioned the witness closely on the subject of the investigation of osteopathy. The witness agreed that at one time medicine was not based on science at all, and he considered that it was then a danger to the public, and he also agreed that, in view of the development of medicine, it would have been a pity if at that time it had been discouraged or handicapped. Any new idea ought to be examined if there was prima facie evidence in support of it, but he did not think that a prima facie case had been made out for osteopathy by the mere fact that large numbers of people had been cured by osteopaths.

Dealing with the demonstration of osteopathic methods which the witness said he had attended eight or ten years ago, Lord Redesdale said he understood that no patient had been present, but that the doctors attending had been made use of for demonstration purposes. Would it be an exactly equivalent case if a number of people decided to look at a

certain microbe through a microscope and took good care to have an empty slide to look at? The witness disagreed with the suggestion, saying that the osteopath present talked about the theory of osteopathy and demonstrated the manipulations and the methods used.

The witness agreed with Lord Dawson that there were in this country and in the United States well-recognized ways and means whereby any new scientific question could be brought forward.

Lord Dawson: The question of the osteopathic lesion involves the subject of anatomy. If the osteopathic theory were true it would be a momentous discovery. There are in this country anatomical societies which do not consist only of doctors who are practising, and there are physiological societies. Would you agree that if any application were made for the bringing forward of a new idea, and if the facts with regard to that idea were properly marshalled, it would receive not only a hearing but a welcome?—I think I have already said that if it were true the osteopathic theory would be the greatest discovery of the age and it would be most welcome to the medical profession.

There seems to be an idea that the medical profession should go out into the highways and hedges and find out all the things that people are thinking. There are recognized tribunals where any new idea from anywhere is welcome if it is brought forward in a proper way. Have you any knowledge that such an application has been made by osteopaths to a recognized society of scientific people?—None whatever.

With regard to the question of osteopaths and manipulative surgeons, would you agree that the crucial difference between manipulative surgery and osteopathy is that manipulative surgery confines itself to a delimited sphere whereas osteopathy claims as its sphere all the diseases of the body?—Yes.

Is not that the reason why it is so necessary to oppose the claims of osteopathy?—Yes.

Your view is that there can be no compromise of any kind with regard to the claims of osteopaths to conduct a parallel system of medicine without medical qualifications?—I quite agree.

Evidence of Professor G. E. Gask

Professor G. E. Gask, professor of surgery at the University of London, was then called and examined by Mr. Radcliffe. He said the main purport of his evidence was to draw the attention of the committee to the vital importance of a thorough training in surgery for anyone who was to practise the healing art. In his opinion it was impossible to distinguish medicine and surgery so far as both training and practice were concerned. Surgery had made great progress during the last fifty years; in the past it had been largely excisional, whereas now it was very much more remedial and preventive. That involved a much wider and more elaborate study of its nature and practice and of all the causes and phases of disease, and a person who intended to practise the healing art should be conversant with all the methods of modern surgery that could be used for the benefit of a patient. The general practitioner should have a good knowledge of surgery, so that he would know when to call in a specialist; he should have an opportunity, during his training, of observing a large number of surgical cases, including acute cases. He had recently studied a number of textbooks on osteopathy and had gathered the impression from them that surgery played a very small part in the teaching and practice of osteopaths. A general practitioner had to deal with cases involving injury or disease or a combination of the two, and, in order to make a correct diagnosis, he should be thoroughly familiar with all forms of disease. He agreed that a patient, for instance, who complained of a pain in the right side of the abdomen should be examined by a man who had been trained in all the various aspects of disease and not by one who had confined his study to one branch only. He did not think there was any one chief cause of disease.

Dealing with the question of education, counsel asked what was the main point that was aimed at in the medical curriculum. The witness said everyone was agreed as to the necessity for a grounding in all the fundamental sciences. It was then considered essential that a student should be grounded in all the branches of medicine and that he should see and examine for himself large numbers of patients and form his own opinion as to the value of the various forms of treatment. In the course of his training a medical student had to spend two years or more in a hospital.

The committee adjourned until Monday.

ELEVENTH SITTING

Professor Gask Cross-examined

When the Select Committee met on April 8th Professor Gask was cross-examined by Mr. Thorpe, K.C. He was asked if he had ever sat in a judicial capacity, and he replied that he was once president of a court-martial.

You signed this statement [the statement on behalf of the professors and lecturers in biological and medical science which had been handed in at an early stage in the proceedings] which condemns in no measured terms the practice and theory of osteopathy. Did you call on the "prisoner" for his defence?—It is common knowledge that the osteopathic creed is that there is one chief factor in disease.

Suppose it was alleged against a prisoner who was not present that everybody knew he had committed the offence, would you proceed to convict him?—No, I think not.

How did this statement come to you?—It was laid on the table of the staff common room at St. Bartholomew's.

Do you know if there were any who did not sign it?—I should think there were quite a number.

Any explanation why they did not sign?—Their attention was not particularly drawn to it.

Some questions were asked of the witness as to what he understood by the osteopathic theory. He replied that it relied on one chief factor in the causation of disease and one chief cure.

In re-examination by Mr. D. L. Jenkins, Professor Gask said that he had never been able to find anything which could be called an osteopathic lesion. Ever since he had been summoned to this inquiry he had considered whether he was so blind or bigoted as to overlook it, and he had gone back to the patients in the wards with that in mind, but still he had failed to discover it. If any evidence for osteopathy capable of investigation were submitted to the medical profession it would be just as carefully investigated as, say, Banting's work on diabetes. Asked by Lord Esher for how long he had been looking for the osteopathic lesion, he said that he had been accustomed for many years to examine the spine for a deformity of any sort, though he admitted that he had not had specifically the osteopathic lesion in mind. As soon as he was summoned to this inquiry he had studied the osteopathic textbooks—a remark which led Lord Esher to say that, evidently, his scientific examination of the osteopathic theory was of extremely recent date.

In the course of an exchange with Lord Elibank the witness admitted to some dubiety as to what was in the Bill, whereupon Lord Elibank exclaimed warmly, "I wonder how many of the sixteen hundred signatories to this document have read the Bill." He read some of the denunciatory passages in the statement, and said, "Is it fair to put in an uncompromising statement like that without reading the Bill? I have nothing more to ask." Mr. Jenkins pointed out that the statement was directed against osteopathy in general, not against any particular proposal in the Bill, but Lord Elibank read the title of the memorandum, in which the Bill was specifically mentioned, and said, "The statement is drawn up on the Bill and nothing else, and Professor Gask has not read the Bill."

In reply to Lord Dawson, the witness agreed that the training for osteopathy ought to be as long and as good as for medicine. Lord Redesdale asked whether the art of diagnosis was not rather a flair than education pure and simple. The witness could not agree; it was the result of many years' patient and detailed observation, with the proper correlation of findings. He thought that given time and attention to detail anybody could be taught diagnosis; it was not a matter of intuition. Lord Carnock asked whether there could be a hard-and-fast line between major and minor surgery as suggested in the Bill. The witness replied that there was no such line; he did not know where minor surgery ceased and major surgery began.

Evidence of the General Medical Council

Sir Norman Walker, President of the General Medical Council, of which, he said, he had been a member for twenty-eight years, presented a memorandum of evidence on behalf of that body. The first part of the memorandum related the history, constitution, and functions of the Council, after which certain observations were offered on the Bill.

In the view of the Council the Bill contemplated a departure from the policy hitherto pursued in legislation with regard to the practice of medicine in this country. The Medical Acts had not been directed to the creation of any monopoly in the healing art, but merely to ensuring the maintenance of a *Register* designed to inform the public of the names of those persons who had carried out a sufficient curriculum and passed examination tests sufficient to justify the appellation "qualified." The standard required by the Council for qualification and registration had not remained stationary, but had steadily risen with the increase in medical knowledge. "It would appear that the provisions of the Bill would create some confusion in the mind of the public, since the new register of osteopaths proposed to be set up would contain the names of persons whose standard of education varied from that laid down by the Council for medical practitioners; and the Bill would further appear to have the effect of substantially restricting the practice of medical practitioners registered under the Medical Acts in certain directions wherein they now practise freely."

The Council was unable to find in the Bill any definition of the scope of the practice of osteopathy or of the nature of that which was to be practised. In some respects it appeared to be based on the Dentists Act, 1921, but there was no practical difficulty in the public mind in apprehending what dentistry was, and where it began and left off. This could scarcely be said of osteopathy, which had no such history or usage. The omission from the Bill of any precise definition of osteopathy was a matter of crucial importance to the public, because under the Bill every person (whether a registered medical practitioner or not) who was not registered as an osteopath was prohibited under penalty from practising the undefined. What was proposed by the Bill was to prohibit large and increasing numbers of registered medical practitioners from practising in a branch of surgery which had been followed by qualified practitioners both before and since the passing of the Medical Acts.

The memorandum went on to point out that the minimum curriculum laid down in the resolutions of the Council specifically provided that every medical student should receive practical instruction in surgical methods, including mechanotherapeutics, and special instruction in orthopaedics if this was not included in the systematic instruction in the principles and practice of surgery. Provision was made for the instruction of students in manipulative surgery by the medical schools, and various schools had established special departments for instruction in orthopaedic surgery, including the use of manipulative methods. The effect of the Bill would be to exclude registered medical practitioners from a field of practice for which they possessed the statutory qualification and to admit exclusively to this field persons who remained unqualified and unregistered. On the other hand, the Medical Acts contained nothing to prevent a registered medical practitioner from adopting any theory of medicine or surgery, including osteopathy.

The remainder of the memorandum was a detailed criticism of the various clauses of the Bill.

Sir Norman Walker, in reply to the Chairman, described the action of the Council with regard to reciprocity, which existed in relation only to two foreign countries—Italy and Japan—and to British Dominions. Some years ago, accompanied by Sir Humphry Rolleston and Sir Holburt Waring, he went to the United States to ascertain whether anything could be done in the way of reciprocity with that country. There was a National Board of Medical Examiners—a voluntary body—in the United States, and most of the States accepted its examinations in place of their own. A "gentleman's agreement" was arrived at between the licensing bodies in this country and the National Board whereby the medical graduates on each side were admitted to the final examinations on the other.

Cross-examination of Sir Norman Walker

Mr. Thorpe asked the witness whether the memorandum he had presented was not now very much out of date, in view of amendments proposed in the Bill. In regard to death certificates and other matters the Bill as now submitted by the osteopaths was quite different from the Bill on which the General Medical Council had commented. He also pressed Sir Norman on the statement that "the Medical Acts have not been directed to the creation of any monopoly." Did he really think that there was no monopoly? Were not registered persons alone allowed to call themselves medical practitioners, to sue for fees, and to sign death certificates? Sir Norman Walker still maintained that there was no monopoly or even a quasi-monopoly, because it was open to anyone in this country to take the advice of any person he chose. "Don't let us differ unless we must," said Mr. Thorpe. "A series of Acts of Parliament have conferred on the medical practitioner a monopoly, and by a monopoly I mean a privilege given to him and denied to everybody else." The witness would only reply that the legislature had laid down that for certain purposes a person must be a qualified practitioner.

He was next taken on the statement that the new register would create some confusion in the mind of the public. Was there any confusion in the mind of the public to-day as between the registered medical practitioner and the osteopath? How was confusion likely to arise by the limitation of the number of non-medical practitioners who might call themselves osteopaths? The witness replied that one of the difficulties in medical administration had been the use of names and initials. The Act of 1858 ought to have made the matter watertight, but the ingenuity of some people had invented descriptions which approached to the legal description.

You say categorically that some confusion will be created in the mind of the public by the passage of this Bill. I ask you to justify that. I am entitled to an answer.—If another register is introduced I do not think people will differentiate between that and the *Medical Register*.

The *Medical Register!* I have never seen the *Medical Register* in my life. If a member of the public has a pain and wants to go to an osteopath he will go to one. The *Register* has nothing to do with it. What member of the public with a pain goes to a *Register*?—I am not suggesting that.

Does anybody consult a register?—Well, if it is not too frivolous, I remember an incident where a lady wanted a doctor and took the directory, uttered a prayer, brought her pencil blindly down on the list, and went to the doctor whose name was indicated.

I could tell a lot of odd things which ladies have done, and gentlemen too, but do you suggest that if I go to a strange town and have need to see a doctor I consult the *Register*?—Well, there has existed for eighty years a *Register* of qualified practitioners. The creation of another register of partly qualified persons would lead to confusion.

It is not enough to say it. I want to know how. Will you put to me a single case where confusion would arise?—It is difficult to provide an example, but I should say that the public being aware of two registers of persons practising the healing art under the sanction of Parliament——

Would you mind adding "under different labels"?—Under different labels, there might be confusion.

"You have said that before," said Mr. Thorpe. "You have nothing to add."

The witness was next asked about his own knowledge of osteopathy. He admitted that he could not sit down and write an examination paper on the subject. The particular branch of medicine to which he had devoted himself (dermatology) had no points of contact with osteopathy. He had no recollection of a patient coming to him and saying, "I have been to an osteopath."

Mr. Thorpe, at the end of this rather sharp cross-examination, said that he was much obliged to the witness, who evidently had not come to condemn, and his memorandum was as helpful to himself (counsel) as it was to the committee.

A Suggested Royal Commission

Lord Elibank asked whether the witness would favour an investigation into the principles of osteopathy. He replied that he had no objection. History was rather illuminating on that point; it took more than half a century to get the Medical Act through Parliament. He agreed that the investigation should take the form of a Royal Commission. Lord Elibank suggested that nobody who had signed the famous statement of the professors and teachers—"There can be no compromise; the theories of medical science and of osteopathy are incompatible and contradictory"—could be regarded as a reliable commissioner. The witness was asked whether he thought a Royal Commission on this subject which would be impartial and unprejudiced could be set up, and indicated the affirmative.

Lord Elibank: An unenthusiastic "Yes."

Mr. Thorpe: A qualified "No."

Lord Elibank took it, therefore, that Sir Norman did not rule out of his mind the possibility that there was a great

deal in the theory of osteopathy. He replied that his emphasis would be rather on the practice of it, because it was very difficult for a medical man, trained as he had been as a pathologist, to assent to the theory.

Lord Esher remarked, in compliment to Sir Norman Walker, that he differed from most of the medical witnesses so far, because they had shown prejudice against osteopathy although they had never made any scientific examination of it. The witness replied that he was, as President of the General Medical Council, the statutory head of the profession, and his business was neither to oppose nor to favour, but to point out the conditions under which the present *Register* was founded, and to urge that proposals to introduce measures more popular in other countries, but representing a departure from what was traditional here, needed to be examined with great care.

Answering some questions on the curriculum, Sir Norman Walker said that the minutes of the Council from 1858 onwards recorded frequent complaints that the student was overburdened. A committee was now sitting, and would present its report to the Council in May, on changes that might be advisable, and it was not improbable that a variation would be made in the first two years of study. At present there was a strong feeling that what was called the block system—the allocation of time to certain parts of the curriculum as distinct from others—had outlived its usefulness. As for manipulative surgery, very particular attention was devoted to this subject in certain schools, appropriately Liverpool. But manipulative surgery in medical teaching was no new thing. When he himself was a student, over fifty years ago, the professor of surgery in Edinburgh, Mr. Sheen, was a strong believer in manipulative methods. Another of the great surgeons of that period used to dwell on the value of exercise in treating sprains and displacements. But more attention was being paid to these methods than formerly. The medical profession was not ashamed or afraid of conversion.

Professional Discipline

The chairman said that the committee had been told of difficulty experienced by osteopaths in obtaining the services of anaesthetists. The witness remarked that it was rather curious that while the public was ready to take advice from any quarter, it pinned its faith to qualified doctors so far as anaesthetics were concerned. It was not illegal for an unqualified person to give an anaesthetic, but it was very seldom done. In the event of a fatality, of course, the unqualified anaesthetist would get into trouble. He went on to refer to the Warning Notices of the Council. In the early years of the Medical Act it was not unusual for practitioners in towns to be assisted by unqualified persons in the surrounding villages, and a number of cases arose in which discipline had to be exercised. Again, before the Dentists Act, 1921, and in part leading up to that enactment, the Council had before it medical men who had given anaesthetics for unqualified dentists. But there had been no complaints with regard to the giving of anaesthetics for unqualified persons since 1912, and from 1898 until that year there were only six such cases before the Council; and in four of these the practitioner was put on probation, in one the charge was found not proved, and in one—the case of Dr. Axham—the name was erased from the *Register*.

He thought that no charge could be sustained against a practitioner for giving an anaesthetic for another registered practitioner who was an osteopath. It was put to the witness that Dr. Macdonald had stated that a pathologist had refused to make a culture for him. "Narrow-minded, I should call it," was his comment. He added that if a medical practitioner made a practice of acting as anaesthetist for an osteopath who was not medically registered he would be liable to be brought before the Council, and, if the facts were found proved, he might be struck off the *Register*, but a body like the Council did not pronounce what it was going to do beforehand; each case was judged on the facts presented. The Warning Notice was directed against such conduct as enabled an unqualified person to practise as if he were qualified. Mr. Thorpe asked what would be the position if Dr. Kelman Macdonald gave an anaesthetic to Mr. Streeter's patient. Sir Norman Walker replied that Dr. Macdonald and Mr. Streeter, being of the same mind, there would probably be nothing improper in such co-operation, Dr. Macdonald being responsible.

Evidence of the Ministry of Health

Sir Arthur Robinson, secretary to the Ministry of Health, a position which he had held for fifteen years, presented a memorandum on behalf of the Minister.

Before the measure of recognition involved in the establishment of a statutory register was given to osteopathy it appeared to the Minister essential that there should be included in the statute a definition of the meaning of osteopathy so clear and precise as to enable it to be differentiated without possibility of mistake from other forms of practice. Unless this could be done, proper administration of the register would seem impracticable. The further elucidation of the issues, scientific and technical, which underlay the difference between the doctor and the osteopath seemed to be a necessary preliminary to the passing of legislation which would confer upon the practice of osteopathy the seal of parliamentary approval. The Bill, if passed, would do more than enable the public, as its promoters claimed, to distinguish the qualified osteopath from the unqualified, it would inevitably convey an assurance that a person who had satisfied the statutory tests for admission to the register was a person in all respects well fitted to undertake the various and heavy responsibilities attaching to the treatment of disease. In other words, Parliament would have given some sort of guarantee of the validity of the principles upon which the osteopath exercised his craft.

Dealing with the proposal to admit persons to the register on the ground that they held certificates granted in a British Dominion or foreign country, the Minister pointed out that it was alien to the general principles so far followed in comparable legislation (medical practitioners, dentists, and nurses) to recognize qualifications conferred by foreign educational institutions, and it seemed a matter for consideration whether a register composed in this fashion was one which Parliament should take the responsibility of commending to public notice. The question of establishing a register of osteopaths might well be deferred until a system of education in the principles and practice of osteopathy had been more fully developed in this country by institutions over which Parliament (or the Board of Registration) would be able to exercise adequate powers of supervision, inspection, and control.

The memorandum next dealt with the repercussions which the Bill might have on certain statutory services for which the Minister was responsible. The passage of the Bill into law would probably be followed sooner or later by further claims from the osteopaths, as, for example, the right to participate in insurance practice and to take a share in the various and important medical duties entrusted to medical practitioners by the Public Health Acts.

"In the light of the considerations alluded to in the preceding paragraphs" (the memorandum concluded) "it appears to the Minister that a sufficiently strong case has not been made out for the adoption of the proposals in the Bill at the present time, and that the proper action at present is to set on foot an organized and careful scientific inquiry into the principles and practice of osteopathy by a body suitable for the purpose. Should this view be taken, those who are now practising osteopathy would, pending the result of the inquiry, have the choice open to them, should they be dissatisfied with their present status, either of qualifying themselves for admission to the *Medical Register* or of constituting a voluntary register of osteopaths, and establishing, as soon as may be, effective training institutions in this country for the appropriate qualification of persons who may desire to be admitted to that register in the future."

In reply to the Chairman, Sir Arthur Robinson said that the Minister had not specifically considered the training proposed in the Bill for osteopathic students; there were others who would advise the Committee on that point. The Ministry had a certain amount of experience of registration; it was responsible for the Acts registering dentists and nurses. Certain of the proposals for admission to the register had created doubt in the mind of the Minister, for it was understood that one of the reasons for a State register was to safeguard the public, and a number of persons in practice would be admitted to the register whose education from the point of view of the safety of the public might be open to question. He did not want to put the point too strongly.

Administrative Difficulties

Sir Arthur Robinson went on to explain administrative difficulties which would arise. There would be a claim on the part of osteopaths to have the same position in the public services—such as the infectious diseases service or the national insurance service—as the medical practitioner, and, of course, it would be difficult to resist such a claim.

Lord Esher asked whether the Minister's view as to the necessity for a scientific inquiry had been modified as a result of the evidence given before the Select Committee. The witness replied that the Minister was indisposed at the moment, and had not been able to study the evidence ; he himself had studied it to the best of his ability, and he would not advise the Minister to vary the memorandum.

Lord Elibank asked how the suggested scientific inquiry would be conducted. The witness said he had it in mind that the Medical Research Council, which was a committee of the Privy Council, and had both a professional and a lay element, should set up a body to do the work. Lord Elibank said that it had been shown during the present inquiry that in the minds of medical people there was a great prejudice against osteopathy *qua* osteopathy, and he himself would view with anxiety an inquiry by a medical tribunal. The witness replied that the Medical Research Council could be relied upon to set up a body as to the impartiality of which no reasonable man could have any doubt. He himself held that view very strongly. "I am satisfied if you say so," said Lord Elibank. Asked as to the scope of the inquiry, the witness said that there seemed to be a theory of medicine advanced by osteopathy, which theory ought to be weighed up in that way ; he had not assumed that the inquiry would go further than that. He added: "Supposing the inquiry did establish that there was some validity in the theory and practice of osteopathy, I take it various other things would have to be considered. Is it right that that theory and practice should be administered on a special register, or that the views of the medical profession in the way of science and teaching should be modified to the extent of admitting something from osteopathy? I have read the evidence laid before you by Dr. Macdonald—very interesting evidence—but whether the conclusion from it is that you ought to have a special register of osteopaths or that the medical curriculum should be extended I do not know."

Asked whether the suggested scientific inquiry should take the form of a Royal Commission, he said that it might do. He thought the terms of reference might be so framed as to allay certain misgivings expressed by the promoters of the Bill. He was emphatic on the point that, pending inquiry, there should be no State register, because whether there should or should not be a State register would be one of the issues. If in the meantime the osteopaths wished to differentiate among their practitioners it was quite open to them to do so by a voluntary register.

Mr. Thorpe asked what assistance had been given by the medical profession in connexion with the Ministry's evidence. The witness replied that the advice of medical men on the Ministry's establishment had been sought, but beyond that there had been no assistance from the medical profession.

If it be proved that it is possible to register properly qualified osteopaths your department would not look askance at it because it might involve additional administrative burdens?—It would be for our department to do whatever was laid on us by Parliament.

It might mean the appointment to public health offices of men able to practise in both branches or it might mean two separate appointments?—Before you get the State to set up a register, assuming there is something in the theory and practice of osteopathy, you would have to consider whether that should not be superimposed on the medical curriculum, and you would have one register instead of two, which from the administrative point of view is much easier.

It has been suggested that duality in the services is impossible?—The difficulty administratively would be very serious.

But not insuperable?—There is nothing insuperable.

Mr. Dickens, for the British Medical Association, asked who would pay for the scientific inquiry, inquiries being expensive proceedings. The witness replied that if it were instituted by the Medical Research Council it would be on the vote for that Council. Bodies like the British Medical Association would be called upon to give evidence, but not involved in expenditure. Mr. Dickens further asked if the witness had seen the amended definition of osteopathy in the Bill and would be able administratively to interpret it without difficulty. The witness replied that if he himself had seen a draft Bill with such a definition in it (especially coupled with the reference to major and minor surgery further on) he would have tried to get more clarity in it. What he wanted was a meaning which enabled this practice to be differentiated from any other form of practice. In the course of further questions with regard to duplication of services, Lord Elibank mentioned that he had received a letter from Scotland asking that "osteopathic panel doctors" should be appointed. The witness spoke further of administrative difficulties. The last question was:

Mr. Dickens: Supposing a register of osteopaths were granted by the State without any preliminary investigation and without the claim of osteopathic theory and practice being made good, can you see any reason why a similar register should be refused to believers in other forms of treatment?—I think if you gave this register without inquiry you would increase the strength of the claims of other artists to similar treatment.

Evidence of the Registrar-General

Mr. S. P. Vivian, Registrar-General, presented a memorandum of evidence concerning the great importance of medical certificates of cause of death.

Such a certificate, he said, was the foundation of two separate systems contributing to the national welfare, both of great value to the community. In the first place, the certificate was the only means by which deaths attended by specific features needing investigation or inviting suspicion could, as a matter of routine machinery, be linked up with the scheme of public safety embodied in the coroners' system. Secondly, this certificate was the raw material of an extensive body of medico-statistical intelligence which played an important part in the promotion of public health.

If the provisions of the Bill in fact secured that the practitioners to whom it entrusted the function of certifying were as a class not inferior to the present class of registered medical practitioners, either in the possession of a trained judgement or in the breadth and extent of their professional education, no question could, of course, arise. But nothing less would serve. The certification of cause of death was not a simple matter. The standard already reached was still very far from perfection, and the responsible authorities recognized that improvement was desirable and were continually seeking to achieve it. There was thus no margin of efficiency which could be given away—no handicap which could be safely accepted.

"Unless the new class of certifying practitioners is as fully equipped as the present class of registered medical practitioners in all those respects of training and experience which go to form a sound opinion of the causation of death, their admission must result in prejudice to the important public interests served by these certificates in regard both to public safety and medical statistics."

Taking up a point which Mr. Vivian had made in reply to the Chairman, Mr. Thorpe asked the witness if he had ever heard it stated that anybody had died from a spinal lesion. Apart from a broken neck he (Mr. Thorpe) was assured that no osteopath had ever stated this as a cause of death.

Mr. Dickens pointed out that if the Bill passed in its present form osteopaths would still have no right to sign death certificates, and he asked the witness as to the position which would arise if a patient under an osteopath died. Mr. Vivian replied that for any registered medical practitioner to give a certificate it would be necessary that he should have been in attendance at the last illness. Failing this, the death would have to be reported to the coroner, who would exercise his discretion with regard to a post-mortem examination and an inquest. He would regard any osteopathic evidence as to cause of death as lay evidence, but he might satisfy himself —as happened now—that in some cases where there had been no medical attendant an inquest was not necessary, or even that a post-mortem examination was not necessary. He would have to make that decision in every case in which an osteopath's patient died.

The Chairman: But we have heard that the osteopath's patients do not die!

Evidence on Behalf of Royal College of Surgeons

Mr. R. C. Elmslie, surgeon in charge of the orthopaedic department, St. Bartholomew's Hospital, and surgeon, Royal National Orthopaedic Hospital, a member of the Council of the Royal College of Surgeons, gave evidence on behalf of

that body. He said that there were three points to which he wished to call their lordships' attention. The first was education. The education of the majority of those whose names would be placed on this register was not of a character which entitled them to be officially recognized, and it would be impossible in any reasonable time to establish a system of education of osteopaths which would be in any way comparable with that of the medical student. The second point was with regard to the use of manipulation in surgery. He proposed to show that manipulative treatment had been used for a long time, and was available within the surgical profession wherever required. His third point was to suggest certain risks attached to manipulative treatment carried on by osteopaths who had not had adequate training in diagnosis, also that the theory upon which osteopathy was based was the presence of spinal lesions which in fact had not been proved to exist. He also desired to add a few words from the point of view of the Chartered Society of Massage and Medical Gymnastics, of which he was chairman of council.

Mr. Elmslie said that three groups of persons would be registered under the Bill: osteopaths possessing a British medical qualification (whom he understood were five in number); those who had the diploma of the British School, and from the account given to the committee of the training at the school it did not appear that the inclusion of such persons would be justified; and finally, those trained in American colleges—colleges which appeared divisible into two classes, those acceptable to the British Osteopathic Association and those not acceptable. An American graduate in medicine and surgery was required to fulfil certain conditions before he could take the diploma of the Royal Colleges, and there seemed to be no reason why the qualification of the American osteopathic college should be accepted in this country. It was suggested that, if the Bill was passed, it would be possible to organize a school of osteopathy in this country comparable with a medical school. Those who suggested this could have little idea of the complexity of organization of a medical school, and he proceeded to give some account of the twenty-five departments of the Medical College of St. Bartholomew's Hospital and of the programme of training. Incidentally, he regarded it as impossible to draw a line of demarcation between major and minor surgery. The division of a tendon was a small operation, carried out through a 1/8-inch incision, but if divided on the wrong case, or badly divided, or badly treated afterwards, it might lame a man for life. He described in particular the orthopaedic department at St. Bartholomew's and the opportunities for a student to learn the work. The total expenditure for the last year on the medical college was £51,104.

With regard to manipulative surgery, it was on record in Sir Norman Moore's history of St. Bartholomew's that in the seventeenth century a surgeon bone-setter and an assistant surgeon bone-setter were appointed, both members of the Barber Surgeons' Company. Sir James Paget in 1867 lectured on bone-setting—a lecture published in the *British Medical Journal*. In the early 'sixties, however, John Hilton of Guy's gave a series of lectures which influenced surgical treatment in an excessively cautious direction for the next thirty or forty years. But the teaching of Wharton Hood (who worked with Hutton, an unqualified bone-setter) and of Howard Marsh gradually overcame the prejudice, and when he himself was a student manipulative treatment was regularly taught. Marsh himself had referred to the first manipulation for an internal semilunar cartilage injury as having been performed as far back as 1782 by Hay; a few months ago it was demonstrated to him by a well-known bone-setter as his personal method. At present an orthopaedic surgeon was attached to practically every important hospital and medical school. The British Orthopaedic Association had 179 members. Surgical manipulations, unlike osteopathic, postulated some direct and detectable anatomical or physiological connexion between the part manipulated and the symptoms presented. Manipulative surgery and massage together, as carried out by qualified surgeons, constituted, in the words of the memorandum to the Bill, "a developing system of treatment of disease." It had been suggested that in asthma manipulations of the chest were osteopathic manipulations, but in fact such manipulations, with chest expansion and breathing exercises, were part of Ling's system of Swedish remedial gymnastics.

In osteopathy the ordinary methods of diagnosis used in scientific medicine were to a large extent ignored. He saw six to eight patients a week who had been to osteopaths, and he took steps to find out whether an attempt at accurate diagnosis had been made. The average osteopath did not follow ordinary methods of diagnosis. Either osteopathy was a complete system of healing based on a new theory of disease, in which case osteopaths should have training and experience in every way equivalent to those of medical men, or it was a system of manipulative treatment, in which case it should be, like massage, ancillary to medicine. He admitted that the osteopath was an expert on spinal manipulations, and it would be remarkable if osteopathy in the course of sixty years had not developed some special skill. So far as osteopathy had methods which were of value the public interest would best be served either by post-graduate instruction of medical practitioners or by practice by osteopaths under medical direction.

Risks attached to Osteopathy

Mr. Elmslie said that osteopaths were claiming more and more the right to use anaesthetics and therefore to carry out forcible manipulations. A condition frequently treated was painful back. In the majority of cases the physical signs to be ascertained on examination were slight and *x*-ray changes absent, or, if present, consisted of abnormalities seen in other people who had no symptoms at all. But backache might be a sign of something very serious—tuberculous disease or commencing cancerous growth in the spine, or referred to some internal organ such as the kidney—and before manipulation was carried out a preliminary diagnosis ought to be made to exclude such conditions. Again, if dyspepsia or abdominal pain were treated by manipulative methods without accurate diagnosis it might lead to serious or even fatal delay in treating the true condition. He also referred to the psychological injury following alarmist statements to the patient about spinal displacements.

Finally, with regard to massage, he described the functions of the Chartered Society, which had a membership of between 9,000 and 10,000. Its period of training had been one year, but in future it would be eighteen months, and its members agreed not to treat patients except under medical supervision. The restriction was an entirely voluntary one, decided by the council, on which, though there were medical members, the majority were masseurs and masseuses.

Speaking with regard to the *x*-ray photographs which Dr. Kelman Macdonald had exhibited to the committee as showing the osteopathic lesion, he said that these were cases of lateral curvature of the spine, a condition understood since Hippocrates and treated by manipulation at least since the time of Ling.

In a brief cross-examination by Mr. Thorpe the following passage occurred:

You find it difficult to make a distinction between major and minor operations?—I think it impossible.

Any osteopath can do a major operation?—Yes, if he likes to take the risk.

Do you not think it desirable that the persons who can do that should be restricted?—If you prevent everybody practising osteopathy you will have to prevent everybody practising Christian Science, and you will have to abolish quack medicines, and keep the healing art entirely to the medical profession.

Is not that desirable?—It is a very large question of public policy. I think you had better leave things as they are. At present a man who goes to an unqualified person does it with his eyes open.

The witness related the case of a patient who had been to an unqualified masseur for six weeks before he went to his own doctor. Then he was found to have a complete rupture of the tendon at the back of his heel and to have been lamed for the rest of his life.

That seems to condemn the practice of unqualified people?—It does.

If you insist on a man being qualified before he practises the danger would be less?—It would, but you have got to go a very long way.

Never mind how long the way if we get to journey's end. Would it not be in the public interest that people called osteopaths should have an adequate education?—I do think so.

Then what is your real objection to the register?—Such a register would be limited to five persons.

You would accept no one as qualified unless he was qualified as a medical practitioner as well?—I would not.

If qualified as a medical man you do not mind what crank he pursues?—Not a bit.

"I shall ask their lordships whether that is in the interests of the public," said Mr. Thorpe.

Evidence of Mr. H. S. Souttar

The next witness was Mr. H. S. Souttar, surgeon to the London Hospital, Chairman of the Representative Body of the British Medical Association, and member of Council of the Royal College of Surgeons. His evidence was directed to the great importance of the hospital and clinical side of the medical student's training. The training of the osteopath had been spoken of as a matter of schedules and hours, but the training of the medical student was something entirely different. He described in detail the manner in which clinical teaching was conducted in the out-patient department and in the wards. He himself had six students attached to him at the London Hospital; sixty beds were divided among them, and each student was expected to take notes of the ten cases allotted to him.

"The whole thing is absolutely open and above board. We insist on no element in diagnosis which we cannot demonstrate. We make no claim for any alteration that we cannot show to the student. Students are critical people, and no student would believe it for a moment if I made mere statements which I could not corroborate from the material at his disposal. Without a large hospital behind him and the great traditions of that hospital, it is impossible for a student to gain that knowledge of medicine and surgery without which he cannot, in my opinion, become a doctor. I want to impress upon you, my lords, the absolute reality of what we place before them, and how entirely open to the student's criticism is all that we do."

Mr. Souttar maintained that osteopathy was something entirely distinct from manipulative surgery. He read passages from a pamphlet by T. Moore, a doctor of osteopathy, and from Streeter's *The New Healing*, and continued:

"A statement is made and a method of practice built on it for which no foundation can be produced, and upon that a whole system is built. Men achieve their own advancement and their own remuneration on statements for which they can produce no evidence whatever. The statement in reference to general disease that a small bone of the spine is out of place is absolute nonsense. The basis of osteopathy is that all disease is due to small displacements of the spine. There is no evidence for that whatever, and to continue to make that statement without any evidence is to expose yourself to a charge of fraud."

Mr. Souttar was still in the witness-chair when the committee rose. The Chairman intimated that after its sitting on April 12th, if the proceedings were not finished on that day, it would not sit again to hear the conclusion of the evidence until May 1st and 3rd.

S. Lomholt states in the *Dermatologische Wochenschrift* of February 9th that among the population of Denmark (three and a half millions) acquired syphilis has diminished from 4,500 cases in 1919 to 700 in 1933, and congenital syphilis from 280 to twenty-nine cases. The statistics are derived from a single centre, which is responsible for all serological tests done in Denmark: notification is anonymous save for initials. Two factors, in addition to State provision of facilities for treatment, have been found to favour the reduction. Treatment is compulsory: this is but little known to the general public, but enables the treating physician to deal with the careless or mentally defective patient. Secondly, exposure of another person to infection by one knowing himself to be syphilitic is legally punishable: this is less effective in securing abstinence than in inducing an infective person to take precautions against infecting others in coitus, for he realizes that an infringement of the law is less likely to be detected if it does not result in an infection of the partner.

Reports of Societies

PROBLEMS OF OUT-PATIENT CLINICS FOR PSYCHONEUROTICS

At a meeting of the Section of Psychiatry of the Royal Society of Medicine, on April 9th, Dr. J. R. REES read a paper on the problems of out-patient clinics for psychoneurotics.

Dr. Rees pointed out the great difficulties of finding suitable treatment in the provinces, and stressed the need for much fuller information about the activities of clinics conducted by local authorities and other bodies. It might be taken for granted, he said, that definite psychoneurotic methods, such as persuasion, re-education, suggestion, and mental analysis, were necessary parts of the therapy at any such clinic. The reports of the Board of Control were emphatic in this respect. The urgent need for the provision of treatment, which had been demonstrated in the past by Professor Culpin's researches and Dr. Gillespie's estimates, had been confirmed by the careful and conservative survey of insured patients by Dr. J. L. Halliday (*Supplement*, March 9th, p. 85, and March 16th, p. 99). There were in the British Isles at the present time 162 clinics or early treatment centres; of these, twenty were child guidance clinics only, while a further ninety-eight provided for children as well as for adults. It would appear that the majority of these could only offer a diagnostic service. There was little to be said in favour of an out-patient clinic at a mental hospital, but a great deal in favour of the clinic forming an integral part of the out-patient system of a general hospital. Patients whose disorders were intermediate between the physical and the mental came more nearly within the scope of the general than of the mental hospital; at any rate, that was the firm conviction of the patients themselves. There were many advantages in having the psychiatric clinic as a separate unit with close links with the general and the mental hospital. The specialist work of psychotherapy differed in demanding more medical time, less nursing, and a more sociological approach. The psychiatric clinic should be capable of functioning on a modified scale as a psychopathic hospital. Dr. Rees thought that much was to be gained both from the point of view of patients and of educational work by combining the treatment of adults and children in the same clinic. The only real early treatment of mental disorder was the solving of the difficulties of childhood. Of the cases which came to such clinics about 46 per cent. were of anxiety neurosis, 13 per cent. of conversion hysteria, 11 per cent. of obsessive-compulsive neurosis, while neurasthenia only accounted for 2 per cent. At the Institute of Medical Psychology or at the Maudsley Hospital approximately 5 per cent. appeared to belong to the psychotic or pre-psychotic groups. In many of the Mental Treatment Act clinics this figure was much higher, being about 22 per cent. The explanation of this divergence seemed to be that psychoneurotic patients were not so often referred to these clinics, which, up to the present, were not in the main prepared to provide radical treatment for the psychoneuroses. The services of every out-patient clinic should be available for the courts; this work was no small part of the consultative function of the clinic. The validity of the psychotherapeutic method rested largely on the quality of the treatment provided. It was of the utmost importance that on the staff of every clinic there should be physicians who had had an adequate training in psychopathology and psychotherapy. Methods of description or classification were of less value to the patient than the aetiological and psychological approach. The two points of view in psychiatry—that of the mental hospital and that of the psychopathologist—should be co-ordinated and brought into the service of the out-patient clinic; a satisfactory position would never be reached while either of these emphasized its own superiority. The aim of the psychiatric out-patient clinic should be to maintain standards of treatment which were in every way comparable with those in private practice.

The details of the clinic should therefore be thought out in relation to this ideal. The educational value of such clinics was fully as important as in any other branch of medicine; the cured, or the uncured, neurotic patient had a definite effect upon society. Successful psychotherapy was the surest prophylaxis of mental disorder. The out-patient problem of the future would demand a great increase in the number of trained psychotherapists throughout the country. The State would have to concern itself with much of the treatment, because the cost of private treatment would always be a difficulty.

A DISCUSSION ON TRAUMATIC SHOCK

At a meeting of the Section of Surgery of the Royal Society of Medicine on April 3rd, with Mr. PHILIP TURNER in the chair, the subject of discussion was traumatic shock.

EVIDENCE AGAINST TRAUMATIC TOXAEMIA THEORY

Mr. R. L. HOLT, after briefly summarizing the evidence in support of the traumatic toxaemia theory of secondary shock, urged the following facts against it: (1) that no observer had satisfactorily demonstrated the presence of any depressor substance in the venous blood from a traumatized area; (2) that the comparative weighings of the normal and traumatized limbs as practised by Bayliss and Cannon failed to give a true picture of the extent of the extravasation and haemorrhage into the damaged area; and (3) that the circulatory changes of traumatic shock differed considerably from those produced by the injection of histamine or other depressor substances obtained from tissue extracts. Marked differences were found in the changes which followed traumatic shock and histamine shock respectively. The changes indicated by the speaker are best set out in the following tabular form:

Traumatic Shock	Histamine Shock
Diminished circulating blood volume.	No marked change in blood volume.
Diminished output of heart before arterial blood pressure falls.	Decline in arterial blood pressure before any diminution in cardiac output.
Removal of small quantity of blood causes death.	Much larger quantity of blood must be removed to cause death.
Marked pallor of viscera.	Congested appearance of viscera.
Lungs pale and heart containing very little blood.	Lungs congested and heart well filled with blood.
Very little blood when solid viscera sectioned.	Solid organs bleeding freely on section.

Mr. Holt narrated experiments carried out by Macdonald and himself repeating and confirming other experimental work against the traumatic toxaemia theory. In no experiment was the blood pressure reduced to a shock level without a loss of plasma and blood into the injured tissues sufficient in itself to account for the onset of secondary shock. In a series of experiments on anaesthetized cats and dogs 45 per cent. of the calculated total blood volume was lost into the traumatized tissues. This local loss from the circulation was believed to be the principal factor in the development of secondary shock. That which followed muscle trauma came on so rapidly as to suggest that it was of neurogenic origin, but Macdonald and he, in a series of later experiments, had found no evidence to suggest that the neurogenic factor was of comparable importance. The administration of a spinal anaesthetic neither delayed the onset nor the issue of fatal shock. In discussing circulatory changes in primary as differentiated from those in secondary shock, Mr. Holt said that it was very easy to produce shock but not so easy to maintain it unless the trauma was very severe, and the healthy animal had a strong tendency to recover from a mild degree of shock by withdrawing fluid from its tissue reserves into the blood stream. Any factor which would tend to prevent the passage of the tissue fluid into the circulation or lessen the volume of the fluid available was to be regarded as a maintaining factor in shock. The circulatory changes in neurogenic shock as compared with traumatic were thus set out:

Secondary Shock (Haematogenic)	Primary Shock (Neurogenic)
Blood pressure maintained.	Fall of arterial blood pressure.
Rise in pulse rate.	No rise in pulse rate.
Vaso-constriction.	Vaso-dilatation.
Diminution in blood volume.	Blood volume not diminished.
O_2 consumption diminished.	No change in O_2 consumption.
Fall in blood pressure serious.	Fall in blood pressure not serious so long as respiratory centre maintained.

He thought, therefore, that some other classification than the division of shock into primary and secondary was necessary. American writers had suggested the following classification: haematogenic, resulting from loss of circulating blood volume (muscle trauma); neurogenic, resulting from loss of central vascular tone (trivial injury, emotional distress); vasogenic, resulting from loss of peripheral vascular tone (histamine and other drug reactions). The adoption of some such classification would do much to remove the present confusion in which the pathology of this subject had been placed.

THE NERVOUS FACTOR AS A CAUSAL AGENT

Dr. DAVID SLOME said that the theory of traumatic toxaemia was based on the shock-like state produced by large doses of histamine, and on the presence of histamine and other depressor substances in the tissues. Trauma to a limb after occlusion of the vessels did not produce shock. This experiment and others cited in favour of the toxic hypothesis were capable of a different interpretation. It could be demonstrated that the quantity of depressor substances in the traumatized muscle was inadequate to cause shock; that occlusion of the venous return from a traumatized limb did not prevent it; that there was no evidence for a toxic substance in the area of trauma or in the general circulation in the shocked state; and that the changes observed in an animal in histamine poisoning differed from those seen in traumatic shock. The experimental evidence did not support the conception of a circulating toxin as the main causal agent in traumatic shock, and some workers had suggested that the fluid loss at the site of trauma might be adequate in itself to account for its development. Fluid loss was undoubtedly a factor of importance, but certain findings suggested that some other factor was also present. Experimentally produced shock was not permanently relieved by blood transfusion. Trauma to the limb of an animal supplied with blood by cross circulation from a second animal would produce shock in the first animal, although only if the nervous pathways were intact. Turning to the nervous factor, Dr. Slome said that trauma to the completely "anaemic" limb was not followed by shock, but in the presence of such complete occlusion of the blood supply the nerve impulses from the area of trauma might be suppressed. Complete denervation of the limb previous to trauma or the exclusion of nerve impulses by continuous spinal anaesthesia would modify the onset of shock. A discharge of nerve impulses from the traumatized area was experimentally demonstrable. The experimental findings suggested that the nervous factor was an important causal agent in traumatic shock, reinforcing the effect of fluid loss at the site of trauma.

THE TOXAEMIC FACTOR

Sir HENRY DALE said that it was good to see this question of shock once more under investigation, and particularly that it was being investigated experimentally and, he supposed, clinically by two different teams. The idea that traumatic toxaemia might be an important factor in some of the conditions to which the term "shock" had been applied first came into prominence during the war, when the Medical Research Committee (now the Medical Research Council) appointed a committee on "wound shock." This was set up fairly early in the war, when the condition which the surgeons at the

front called secondary wound shock was creating anxiety. Experimental work, largely in America, had produced two rival conceptions of the physiological error responsible for circulatory collapse—namely, (1) that it was due to exhaustion of the vasomotor centre by over-stimulation, and (2) that the vasomotor centre was over-active, but failed to maintain an adequate circulation on account of oligaemia—a lack of blood in effective currency. Such evidence as could be obtained from observation under war conditions suggested that the second conception fitted the majority of cases to which the term "secondary wound shock" was applied. Haemorrhage or sepsis (both were usually present to an unknown extent) could obviously bring about such a condition.

The action of histamine, which was known to produce a shock-like condition, then began to be studied. It showed the possibility of a circulatory failure in many respects resembling that seen in cases described from war hospitals, without haemorrhage or sepsis. This experimental condition was useful for therapeutic trials, and the effect of anaesthetics upon it was of special value in that connexion. The suggestion that traumatic shock might be due to toxaemia of the histamine type, however, was essentially based on the experiments of Bayliss and Cannon on the circulatory depression following crushing of the limbs in anaesthetized cats. He had suspected at the time that haemorrhage into the damaged tissue was making a larger contribution than was commonly supposed, and it was now known that the voluntary muscles of the limb which those investigators traumatized were almost peculiar among the major tissues of the body in the very minute amount of histamine that they could take.

Whatever else it was, the shock following the Bayliss-Cannon limb trauma was not histamine poisoning. Mr. Holt had said that it could all be explained by loss of blood and fluid into the site of the trauma, but he (Sir Henry Dale) could not explain it in that way. There was a sufficient loss of blood into the traumatized area to result in a sudden fall of blood pressure. Haemorrhage or mere loss of fluid as such into the traumatized area was inadequate as an explanation. Dr. Slome had put forward the view that his experiments with spinal anaesthesia demonstrated that an equally important factor was the nerve impulses, presumably of a painful type, from the traumatized area, coming up in a continuous series and reaching the central nervous system. That might be the beginning of an explanation, but he did not think these two explanations together represented the whole of it. The shock that was produced was on an animal deeply anaesthetized. He was not sure that it was right to compare that with the shock seen in a street accident case. To say "sensory impulses" was only to make a preliminary shot at the explanation; it did not describe what happened. What was it the sensory impulses did? Was this a return to the vasomotor exhaustion theory? That would be incompatible with Mr. Holt's evidence, because he with Macdonald had put forward experiments in which they showed that in neurogenic shock the blood volume restored itself by taking up fluid from the tissues. He agreed that arterial dilatation led to a big fall in blood pressure, but not oligaemia—rather an increase in the blood volume, because the blood took up fluid from the tissues. But in his traumatic shock experiments Mr. Holt had demonstrated that the blood was concentrated and went on falling in volume as the fatal issue was approached. There was actually an increase in blood corpuscles in spite of the big haemorrhage. That meant that something very different from arterial dilatation had been going on. It was exactly the phenomenon which could be brought about by an overdose of histamine, yet these animals were certainly not suffering from histamine shock. For one thing, histamine shock was a matter of a few minutes, and the shock here under investigation was a matter of hours. He was not at all sure that there had been ruled out the possibility of substances absorbed from the injured tissue which had a long-range effect and gradually broke down the permeability of the capillaries so that eventually a condition was reached such as had been described. Supposing there were some substances which—not immediately like histamine, but at long range, with a long latent period in their action—gradually led to that breakdown of the resistance of the capillary walls: was it not possible that such an effect would come about as the experiments had indicated? In any case he expressed the hope that conclusions would not be drawn too widely or too hastily from experiments of one type—trauma of the legs of anaesthetized animals. There were various conditions which had been called shock at different times, and it might be that by such methods one of these was being experimentally reproduced. He did not imagine for a moment that all the conditions were being reproduced, and he did not think that the evidence yet advanced entitled them to rule out some form of toxaemia as an important factor in some kinds of shock.

Mr. L. F. O'SHAUGHNESSY said that a traumatized limb with a broken femur was a rather different proposition from a traumatized limb in which muscle only was injured, where there was a big fluid loss. The term "secondary shock" was a mistaken one. The idea was very old, and was used as long ago as the 'seventies to explain the death of people a long time after the injury. It was afterwards abandoned, and there was no further mention of ordinary secondary shock until the literature of the war period. In his own clinical experience he had never seen a case of secondary shock, nor read a satisfactory account of such a case, nor seen it experimentally produced. Following trauma the syndrome progressed either to recovery or to a fatal end. There was never an initial recovery followed by a later onset of shock. It was true that an injured man or animal might become worse in the hours or days following the injury, but there was always an explanation of this, such as haemorrhage, or, in the war, the effects of gas gangrene. The condition referred to as primary or neurogenic shock was something occurring at once and recovered from at once, as in syncope. Of the clinical signs of trauma the most important was that a traumatized person or animal was extraordinarily sensitive to any further injury or loss of blood. Sometimes the mere effect of moving the injured man from one place to another really killed him. Many traumatized people did not feel any pain. Very often a person with a crushed limb had no pain whatever. He and his fellow worker had always described these impulses as nervous impulses; not that they were sensory or pain impulses.

Prof. R. S. MCDOWALL said that surgical shock was the problem of the experimental physiologist just as much as of the surgeon. He wished to say nothing to discourage workers in this field, because too little work had been done, but it would be a pity to assume that what was said about the control of the circulation in the ordinary textbooks was necessarily all that was known. What was known or written in the ordinary books was by no means the limit of what was almost stock physiological knowledge among those more familiar with questions of circulatory control. Dr. GALE (St. Bartholomew's) mentioned some work on the estimation of blood sugar in surgical operations. The blood sugar was found to be higher in operations in the region of the solar plexus than in operations further away from such an important nerve centre. Mr. C. HOPE CARLTON mentioned observations made on some fifty cases of people suffering from a condition indistinguishable from that known as secondary shock in which exsanguinating transfusions were obtained by the method of Bruce Robertson of Toronto. These cases were carefully observed, and the clinical condition ofter exsanguinating transfusion was hardly at all improved, and after a year's experience the method was discontinued. If this was secondary shock, as it appeared to be, it could hardly have been due to the presence of toxins, because the method employed would at all events withdraw these. The PRESIDENT mentioned some war experiences, when shock was generally associated with haemorrhage, and the value of nitrous oxide and oxygen anaesthesia was demonstrated.

CARE OF PREMATURE INFANTS

At a meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland on March 8th, with the president, Dr. T. M. HEALY, in the chair, Dr. W. R. COLLIS read a paper on "Premature Infants and their Management," in which he stressed the importance of maintaining the body temperature, and showed figures and graphs of the weight curves of babies treated in the Rotunda Hospital nursery.

The difficulty in maintaining the body temperature was found to be largely overcome by the administration of thyroid extract, while it was very difficult to keep the temperature up by external means only. It was essential to chart the baby's temperature regularly, so that any fall might be noticed at once. The babies were nursed in electrically heated cots, but the nursery itself was kept at ordinary room temperature, as it was found that high temperatures interfered with the efficiency of the nursing staff. The babies on thyroid extract showed an improvement compared with the control babies treated without it.

The PRESIDENT said that most obstetricians realized that they had not been doing nearly enough for very small babies. Dr. Collis had mentioned that nurses did not even take the temperatures of premature babies. He thought that not only did they not take temperatures, but they did not take the babies seriously at all, and concentrated all their attention on the mothers. Dr. Collis's figures regarding the administration of thyroid were impressive, and he hoped that in future the results obtained from this treatment would be even better. He asked at what time Dr. Collis ceased to call a baby premature. Referring to the habit of wrapping up babies in Gamgee tissue, he said it had always seemed to him that this was not a suitable thing to wrap them in, as it did not keep them particularly warm, and warmth was so essential.

Dr. A. DAVIDSON (Master of the Rotunda Hospital) said that Dr. Collis's paper showed quite clearly the benefits that could be gained by the administration of thyroid extract. One of the most important changes that had recently taken place in the Rotunda Hospital was the appointment of a staff nurse for the nursery. In the hospital the assistant masters were in charge of the babies until they felt that for some reason or other they wanted a second opinion on them, and that was when Dr. Collis, the paediatrician, was called in.

Dr. BETHEL SOLOMONS congratulated the Master of the Rotunda, Dr. Collis, and the staff nurse in charge on the excellent results obtained with premature infants. When he (Dr. Solomons) started the paediatric department he was handicapped by want of funds. Nursing was the most important part of treatment, and he had always taught that heat and fluids were the two keynotes. Thyroid extract seemed to be an excellent adjunct in producing heat. He had always found that babies of 3 lb. and upwards survived with good treatment, and he suggested that a chart showing the exact weights of the infants would be invaluable. He did not believe in any mask unless a sheet of cellophane or brown paper was inserted between the folds of muslin. In Holland they were using the urine of pregnant women in the treatment of premature infants: it seemed to be the easiest way of obtaining hormones.

Dr. DOROTHY PRICE said that Dr. Collis had revolutionized in Dublin the treatment of premature babies. When she saw premature babies at St. Ultan's Hospital the mothers had been at home for some days, and had had the babies there with them. She thought it was a great advantage to see the babies in the Rotunda immediately after they were born, and when they had not had a chance of picking up any germs. The treatment of them in these circumstances was bound to yield more favourable results.

Dr. COLMAN SAUNDERS thought the chief trouble with premature babies was their feeding; it was so difficult to get enough food into them, and the gastric mortality in premature babies was very high. It was very difficult to give thyroid in sufficient quantities for it to be really effective. The temperature should be taken from the moment the baby was born. He thought that any baby under 5 lb. in weight when born should be treated as premature. In some cases a fortnight after birth he gave iron, and at the end of a year the babies were quite normal.

Dr. COLLIS, in reply, said that he did not like to see babies wrapped in Gamgee tissue: it was much better after they had been impregnated with oil to wrap them up in a woolly shawl. These babies were always very anaemic, and undoubtedly a great many of them would die unless they were very well looked after. In Germany there was a regular trade in the selling of breast milk. It was very often extremely difficult to get the babies to take any food at all, and the food had to be put into them by means of a tube. If this was done carefully it would not start really bad diarrhoea.

CORRESPONDENCE

Gastrectomy

SIR,—Mr. W. H. Ogilvie deserves our warmest thanks for his two recent articles on the surgical treatment of gastric and duodenal ulcer. I believe they mark a distinct epoch in the writings by British surgeons on this subject, which is one of almost universal interest to the medical profession generally, just as it is of special interest to the great bulk of general surgeons. To not a few of us it is of personal interest as well, for probably no section of the public suffers more frequently or more severely from ulcer of the duodenum than the medical profession. The questions raised by Mr. Ogilvie are too numerous to be discussed in any single letter of such a length that you, Sir, could be expected to publish it. Will you allow me to refer to two or three points?

1. As to the value of a surgeon's estimate of the results in his own cases. Mr. Ogilvie does not, I submit, afford to this experience the great value it undoubtedly possesses. In my opinion he does less than justice to his surgical brethren when he denies them that honesty in the critical examination of their own operative work which the public and the profession expect from any surgeon of good standing, an honesty which in fact he claims for himself. My own view would be that the surgeon's review of his own results, rather than those of others, is of particular value not only to himself, knowing as he does his own methods and his own limitations, but also to others who are working at the same problem. Even if experience is at times apt to be fallacious it is not always nor even generally so, whilst it affords to him the main indications for changes of technique, and in the end directs the operative methods of the future. Indeed, I find in the papers referred to that it is claimed to be the solid foundation upon which Mr. Ogilvie bases his own recommendations for the changes in surgical practice which he advocates. He suggests that in the case of gastro-enterostomy "interpretation varies with the mentality of the patient and the observer . . . that relapses usually make their appearance *after some years* (italics are mine) and reports of individuals are notoriously unreliable." Surely there is no reason why these remarks should not apply equally to Mr. Ogilvie's results of gastrectomy for duodenal ulcer, with this additional force to the argument that the element of time has not yet had the same opportunity of checking his results!

2. Has gastro-enterostomy had its day? The reports of gastro-enterostomy as published by operators in the early years of the twentieth century were no less remarkable and no less convincing than are those of Mr. Ogilvie to-day, and yet we know that at that time the operation of gastro-enterostomy was done for conditions now rightly regarded as being most unsuitable, and for which no one nowadays would ever dream of doing any short-circuiting operation whatsoever. Since then great advances have been made in the surgery of the upper abdomen, but these are not due to the discovery that gastro-enterostomy

is a bad operation, as Mr. Ogilvie asserts, but in finding out that it is not of general applicability to all patients suffering from indigestion. In those early days, for example, all cases of gastric stasis were treated by gastro-enterostomy, whether the stasis was due to pyloric spasm or to organic obstruction. Subsequently, the same operation was done for gastric and duodenal ulcers whether these showed stasis or not. Indeed, a duodenal ulcer, at whatever age it occurred, had a routine gastro-enterostomy performed as soon as the diagnosis had been established, whilst gastric ulcer merely demanded the placing of the stoma proximal to the ulcer if this were possible. Since then two outstanding discoveries have been made, and made, moreover, by most surgeons for themselves and from their own observations: (*a*) that gastric ulcer incurable by medical means is rarely cured or even improved by gastro-enterostomy, and (*b*) that no operative procedure yet published relieves permanently a functional dyspepsia, even in the presence of gastric retention of marked degree, and so in the latter case nothing beyond establishing the diagnosis by general abdominal examination and perhaps removing an appendix is now done, whilst for a gastric ulcer all surgeons are convinced that partial gastrectomy is the operation of choice, and (as Lake and others have pointed out) the section of the stomach need not necessarily be proximal to the ulcer. So successful has this latter procedure been that I am doubtful if in the elderly a high gastrectomy is ever necessary. Surely this change in view, with its consequent change in treatment, has resulted from previous surgical experience!

3. But the most difficult problem still remains, and its solution is the main objective of Mr. Ogilvie's argument—What part has surgery to play in the treatment of duodenal ulcer? Obviously, as Mr. Ogilvie recommends, medical treatment in its widest application is the first line of defence against any form of surgical intervention. Every surgeon, and most physicians also, will agree that some cases of duodenal ulcer will refuse to remain permanently well, and some will continue to bleed, even after prolonged and frequently repeated periods of such medical treatment as any average patient can be expected to carry out. Up till recently the most generally adopted line of treatment has been gastro-enterostomy, though duodenectomy and pyloroplasty have been advocated strongly by some and tried by most operating surgeons. The results of any of these operations do not differ materially, whilst gastro-enterostomy scores in its simplicity of technique. Satisfactory results may be anticipated in at least 80 per cent. of cases. There remains, however, the figure of 20 per cent. in which a considerable degree of invalidism remains. If Mr. Ogilvie's method affords a solution of their problem his name will go down to posterity with those of Mayo Robson, Moynihan, and Walton, and be written large upon the abdominal surgery of our time, and many surgeons who now pin their faith to gastro-enterostomy as suitable in selected cases of duodenal ulcer will be prepared to consider partial gastrectomy, even for these. But the results of gastro-enterostomy cannot be divided into two clear-cut classes and labelled respectively "good" and "bad." They form a very oblique gradient, at the one end of which are those patients who can forget that they have ever had such an organ as a stomach, who can eat and drink to their heart's content without ill effect of any kind. Can we select the type of patient from whom such a result may be anticipated? At the other extreme we find those unfortunate individuals who, after operation, rapidly develop fresh symptoms, and in the end become established examples of jejunal ulcer: never altogether free from pain, they have, in addition, intermittent attacks of such severity that they are willing to submit to any form of treatment showing the smallest hope of affording relief. Truly these are the tragedies of abdominal surgery! Can we avoid the types in which such a complication may be expected?

The sufferer from jejunal ulcer seems to me to resemble the lost sheep in the parable. His dangerous position demands an utter disregard for the ninety and nine safe within the fold and a concentration of skilful effort to bring about his salvation. I yield to none in my admiration for Mr. Ogilvie's heroic search for the missing member of the flock. I cannot, however, approve of his plan of taking the ninety and nine with him in his hazardous adventure into the wilderness, for I fear that when he returns not only may the lost sheep be still accounted missing, but that some of the others also may have fallen by the wayside, and will fail to answer their names in the final roll call.

But it may still be that Mr. Ogilvie does not really take the extreme view stated in his original papers, for I find that more recently he has placed it on record that for three cases in a month he had himself performed the operation which he so forcibly denounces, and so I am disposed to believe that where duodenal ulcer has persisted for such a length of time that organic pyloric obstruction has occurred Mr. Ogilvie still performs the rejected operation. It must therefore be assumed that there are still cases of duodenal ulcer which ought to be treated by gastro-enterostomy. In my opinion cases of duodenal ulcer requiring surgical treatment of some sort may be subdivided into (1) the recent ulcer of short duration in young patients where the abdomen is irritable and distended and the gastric acidity high, and (2) the old case with flat abdomen, dilated stomach, flabby abdominal wall and abdominal organs soft and atrophied, and the gastric acidity moderate or low—in short, the type of case which even Mr. Ogilvie treats by gastro-enterostomy. Between these two extremes all gradations occur, and there is therefore plenty of room for the display of surgical judgement. If my reading of Mr. Ogilvie's paper be correct he has no fear of operating by a high partial gastrectomy in the first type of case. Up to the present many partial gastrectomies have been done for cases of this sort, but they have been the most frequent sufferers in later years from jejunal ulcer. If Mr. Ogilvie's operation of a *high* gastrectomy can prevent this tragic result, as well as regurgitant vomiting and post-prandial distressing distension, he will have proved his case. If not, and if a certain proportion of the cases, even 1 or 2 per cent., result in jejunal ulcer, and if, in addition, the immediate mortality instead of being negligible as it is in gastro-enterostomy increases to an appreciable extent, then the last state of the duodenal patient is worse than the first, for after a gastro-enterostomy the immediate mortality is infinitesimal and the *status quo ante* can always be regained, but after a gastrectomy the surgeon will have failed altogether in some cases, whilst in the others he will have left his patient in a perilous position, from which retreat is impossible.

What, then, is the present position of surgery in relation to duodenal ulcer in view of Mr. Ogilvie's suggestions? Not surely that high gastrectomy should be the inevitable choice for all cases demanding surgical intervention. If such a view were adopted I cannot think it would result in a better final series of statistics. I believe there is still a wide field for gastro-enterostomy among old-standing cases of ulcer, while for the more recent cases occurring in early life, especially if bleeding has occurred, Mr. Ogilvie's method holds out a hope of permanent cure, not hitherto possible; and if this be the verdict after the extensive adoption which his method is certain to obtain within the next few years he will deserve, and will no doubt receive, the grateful thanks not alone of many patients but of the great bulk of an appreciative profession.—I am, etc.,

Belfast, March 31st. S. T. IRWIN.

SIR,—I have been following with great interest the correspondence upon this subject. As a humble provincial surgeon I would like to make the following confessions: (1) Gastric, as opposed to duodenal, ulcer, in my experience anyhow, is a comparatively rare disease in this district. (2) The opportunities, even if one sought them, of performing gastrectomy for gastric ulcer are therefore few and far between. (3) It takes me two hours or more

to complete the mutilation. (4) I have therefore given it up in favour of a three to six months' temporary jejunostomy. (5) I have done this simple operation for gastric ulcer (non-malignant) only fourteen times in the last ten years, and therefore am unable to dogmatize about it. But ten of my patients appear to be cured, two partly relieved, and two unrelieved.

Temporary jejunostomy is the nearest approach I know to putting the stomach at rest, and it enables the physician to "work his wicked will" unimpeded by the presence of food in the stomach. I need hardly add that temporary jejunostomy alone is contraindicated in any case where there is obstruction to the flow of food, through either the stomach or the pylorus.—I am, etc.,

Bath, April 6th. CECIL TERRY.

SIR,—One point in the correspondence about duodenal ulcer and its treatment, either by gastro-enterostomy or by partial gastrectomy, has not been stressed. In the North, where duodenal ulcer is very much commoner than gastric, the small number of gastro-jejunal ulcers which form occur almost entirely in those who have a family history of the disease. At least that has been my own experience, but being now unable to have ready access to the material I cannot give the figures. An investigation of this kind would yield fruitful results.

It seems to me that the incidence of stoma ulcer and of recurrent duodenal ulcer should be considered in this light by a statistician, together with the figures for the cure of duodenal ulcer in those who survive perforation, so as to see what the actual correlation is. In 1913, as a result of watching the after-history of seventy cases of perforation, I began to show students that perforation alone cures a duodenal ulcer in six out of ten cases: in the acute type of ulcer the percentage is about 90 and in chronic ulcer about 50. The failures, and they are lamentable, occur in cases with a family history of ulcer. Only very occasionally do they result from narrowing of the pylorus. Similar observations at three to seven weeks after perforation show how very rapidly huge duodenal ulcers can disappear. The reason is clear. Perforation takes the core out of the boil and the suture employed everts the unhealthy, clogged mucous surface, and allows it to clean itself. Anyone who has done the emergency surgery in a large ward for a number of years knows that cases of perforation of an acute ulcer seem to arrive in epidemic fashion. The subject would bear investigation by the public health authorities and might be regarded as a type of food poisoning.

There are two inferences. First, that gastro-jejunostomy is never justified at the operation for perforation of a duodenal ulcer. This fact has been well recognized in this country for many years now. Secondly, that the causes of acute and chronic duodenal ulcer are not necessarily identical.—I am, etc.,

London, W.1, April 1st. G. H. COLT.

"Cancer and Causation"

SIR,—Presumably, Professor G. W. Nicholson published his communication in the *British Medical Journal* (March 30th) with the laudable intention of helping Dr. A. H. B. Kirkman and "a large majority of the medical profession" who are profoundly dissatisfied "with the mass of contradiction and the confusion of ideas that represent the cancer problem, so-called." Clarity of thought and lucid exposition are of course essential to the proper presentation of any problem, so I anticipated that a perusal of the paper would afford an instructive lesson in the art of thinking and of expressing thoughts. I have been disappointed, perhaps because I expected more perspicuity on the part of one who has devoted so much of his time to "Studies on Tumour Formation." It is embarrassing to the sympathetic reader that the author should be fighting for breath, so to speak, in an attempt to render intelligible certain simple views which are neither new nor difficult to understand, although Professor Nicholson's literary efforts are such as to lead us to an opposite conclusion. This unfortunate impression militates considerably against the success of his undertaking.

To pass to details, I would like to suggest that the title itself is by no means as definite as titles should be. What does "Cancer and Causation" mean? Is "The Causation of Cancer" intended; or does it mean "Cancer and Causation (in general)"—whatever that may signify? We have some indication in the text that "causation in the living organism" is the explanation; but in any case the title is vague and indefinite—an inauspicious start. Then surely the paragraph on malignancy is a notable example of obscurity of expression or of confusion of ideas, for there cannot be anyone who could comprehend malignancy as a *cause*, or not a cause, of cancer. The idea is to me meaningless. Besides, there was no necessity to drag such a proposition into the discussion at all.

Again, rightly or wrongly, I cannot follow Professor Nicholson in his argument that "the cause of cancer is a reaction of the organism to stimulation." I should have thought that the tissue reaction was cancer. One cannot regard, for example, the mental reaction leading to criticism as the cause of criticism. The cause is the stimulus of the mental reaction—in the present case Professor Nicholson's paper. To argue otherwise is what most people would describe as sophistry.

As to the other views mentioned, I have no fault to find with them, as such, for they are my own, and may be found scattered through my writings on malignant disease during the last twenty years (see *Some Aspects of the Cancer Problem*, 1930, and the original papers to which reference is made therein). Apparently Professor Nicholson is unacquainted with them. That cancer is a biological phenomenon of some kind is a very old idea. It is difficult indeed to say who was the first to attach a biological significance to the condition. It is a view I have always held myself, as my descriptions of the nature of malignant neoplasia clearly demonstrate. Some years ago I wrote:

> "Whether we have been looking for too much and are expecting to find more than there is to find, the future alone can decide. For ourselves we feel that if we have not now presented a complete biological cycle of events . . ."

I agree that in cancer, with the multiplicity of exciting factors concerned, it is the tissue reaction (growth process) which is important. But this is not a new idea, for ten years ago I published the following statement:

> ". . . The most important aspect—namely, the *specific process*, as I call it—has been neglected in the hunt for a specific cause, or for specific causal factors acting in conjunction. Still, it is the result rather than the cause, as I hope to show, that is important, for undoubtedly malignant neoplasia is a specific process, but that is not to say that because a process is specific the cause must also be. Those who ascribe specific processes to specific factors are on hazardous ground, for there is plenty of evidence that specific processes of a similar character to that we are discussing . . . may be induced by many inciting factors."

I imagine that no one would deny to-day that there are many factors which have carcinogenic properties.

In conclusion, may I say that I admire the courage and generosity of those who are prepared, as we all should be, to recognize any honest endeavour, for officialdom has too long reigned dictatorially over scientific enterprise. In the case of Mr. Morley Roberts we have witnessed such an endeavour, but probably we are not all agreed as to the merits, strictly considered, of his

writings. His ideas are not original, as Professor Nicholson presupposes, nor have they the support of scientific research, except by way of inference relating to the work of others. Moreover, as Mr. Sampson Handley has stated in the Preface to *Malignancy and Evolution*, the chief contention is obviously fallacious.

I hope Professor Nicholson will forgive the remarks I have made. The task he undertook was a thankless one, and it may well be one that is impossible of fulfilment at the present time. Nevertheless, I would repeat to all concerned the advice given to me by one of my surgical teachers when through him I was asked to write my first book: "Pray for the gift of lucidity." I am still doing so.—I am, etc.,

W. BLAIR-BELL.

Eardiston House, nr. West Felton, Shropshire, March 31st.

SIR,—The contributions of Professor Nicholson to the study of cancer have been of such outstanding value that one hesitates to question the soundness of any of his considered opinions. It is quite possible that the point of view of Mr. Morley Roberts has not been fully appreciated in every quarter, but the suggestion that the general body of research workers in cancer has neglected or failed to apprehend something of profound significance in Mr. Roberts's exposition is not justified. To suggest, further, that this exposition is sufficient to clarify the "mass of contradictions and confusion of ideas that represent the cancer problem, so-called," is too flattering to Mr. Roberts and much too severe on those who have added greatly to our knowledge of the cancer process in recent years.

In a well-balanced approach to the subject there is no wide breach between the nature of the stimulus and the biological reaction which it evokes. Surely those who attempt to analyse the nature of the stimulus as an exciting cause of cancer are guided at every turn by the response of the cellular entities to which their experimental stimuli are applied. Our need at the moment is to encourage the acquisition of fresh facts from every source and to make a much bigger effort than hitherto to co-ordinate existing knowledge. The belittlement of any line of investigation, if it be followed scientifically, in either aetiology or therapy, is unwise, and would lead us back to that excessive tendency to disputation which has often in the past obscured real issues, and from which we are happily emerging.

Professor Nicholson invokes the science of logic. It is competent and correct to state that the major premise on which he and Mr. Roberts found their whole argument may be entirely wrong, and should never have been accepted by them or by others without much closer scrutiny. I refer to the idea that there exists a vast multiplicity of exciting causes of malignant growth. The most significant grouping of facts which has emerged in recent years is that the so-called carcinogenic agent in tar has a relation to substances which are regarded as growth factors in the body. Through the whole range of the multicellular animal world there is provision made for the repair of lost or damaged tissue by the proliferation of adjacent cells under stimulation, be it from extravasated blood, the viscid coating without which a granulating wound of the surface cannot progress, or those infected discharges which are actually made use of by Winnett Orr to accelerate healing in an osteomyelitis. These stimuli to healing can, it is true, be evoked in a great variety of ways. We see them on the under surface of the hyperkeratotic mass of arsenic or old age, in lupus ulceration or the chronic ulcer following burns which cannot heal on account of mechanical traction, in the dermatitis from *x*-ray exposure, in the ducts and passages of the body wherever organic debris may collect on however fine a scale. These substances, however produced, are taken for granted as effective factors in healing. What association have they with cancer? They are good servants but bad masters. Acting where cellular loss has been sustained, they induce a proliferation which is later slowed down by differentiation as normal repair. Acting over long periods, where no repair is required or where mechanical or vascular changes stultify the attempt, these substances may induce a functionless proliferation which we know as a malignant growth. The tar which is found in every pharmacopoeia as a healing agent is carcinogenetic on the intact surface.

This is at least a valid hypothesis. The carcinogenetic quality lies in the misapplication of a stimulus which has a benign effect where there is a functional need. I would go further even than Professor Nicholson in regarding cancer as a biological process, because the stimulus is considered to be as intimate an essential of biology as the response which is evoked. Perchance Professor Nicholson will admit that those who maintain an interest in the stimulus are not necessarily working on a "logical fallacy."—I am, etc.,

J. J. M. SHAW.

Edinburgh, April 1st.

SIR,—I was interested in Professor Nicholson's paper, where he emphasizes his view that cancer is a biological problem, and that it is a *single* reaction of the organism to stimulation of *many and varied types*. The following quotation from a paper by myself on "The Biological Significance of Ovarian Tumours in the Fowl," in the *Journal of Cancer Research* (vol. xiv, No. 4, October, 1930), may be of interest, therefore, in the present connexion:

"It might seem from these observations that, if the cells of a tissue are stimulated to a prolonged, abnormal, and unnatural degree of functioning, whether by a local irritant or physiological impulses, there is a possibility, especially if cells with a considerable reserve of developmental potentialities either in them or behind them, and of an embryonic nature, are involved, that there will be hasty and irregular improvization of the cell machinery to meet the call. The finely adjusted balance of the activities of the tissue cells to one another and to the body as a whole of ordinary conditions will be upset, and a state of disorder, anarchy, and disharmony ensue, which may easily lead to tumour formation—that is, to a continuous piling up of cells which, owing to their mode of origin, are in reality useless and unable to perform their intended function.

"Behind this view is, of course, the idea that *function* dominates the life and activities of the cells, that they have a purpose in life, and that they react to all and any type of stimulus by attempting to exhibit, in whole or in part, their specific function. This signifies also that hypertrophy passes by easy gradations into tumour formation. In the condition of limited progression, from which the name is derived, hypertrophy occurs most typically in tissues the cells of which have no reservoir of cells with developmental potencies behind them, and where time is allowed for a stabile edifice to be constructed."

One of the main conclusions was as follows:

"The idea underlying the present view is that unnatural hyperstimulation, whether by means of a general nature, such as nerve impulses, hormones, cledones, etc., or locally by irritants, leads through hypertrophy and hyperfunction to a condition of perversion of growth and dysfunction or absence of function. To stimuli of very varied nature the organ, tissue, or cell reacts uniformly by increasing the machinery for functioning and thereafter exhibiting increase of its intrinsic and specific function. As in other machinery, however, persistent and erratic overworking leads to breakdown and disintegration. This conception applies not only to tumours, including leucosis, but also to other disease conditions, of which pernicious anaemia may be cited as an example."

It is necessary to add that I did not know of and had not read Mr. Morley Roberts's book.—I am, etc.,

J. P. MCGOWAN.

Aberdeen, March 30th.

The Report on Fractures

SIR,—At the recent meeting of the Physical Medicine Section of the Royal Society of Medicine it was obvious that many members of that specialty felt that in the report of the B.M.A. Fractures Committee their efforts had been discouraged. I have also had some personal letters to that effect. I do not think that this was in any way our intention. It was to stress clearly the importance of re-education and functional activity as opposed to any purely passive treatments. But this does not imply that the latter are valueless, and personally, at the Royal Free Hospital, I have had the opportunity of observing the effects of certain electrical treatments, carried out in association with my orthopaedic department (both in fracture cases and in others), notably anodal galvanism, the sedative and analgesic effects of which are of real value. I think that the results of this method justify further work on the subject, so that, if larger experience were to prove that benefit consistently accrued, it might take its place in the routine treatment of fractures where obtainable.

The report made no reference to this, as it is obvious that the time is not ripe nor the money available for its general employment at present; but I feel that, while adhering to our general proposition, we should not discourage further research in the application of such ancillary methods.—I am, etc.,

London, W.1, April 2nd. P. JENNER VERRALL.

SIR,—With Mr. Eastwood's assurance that his criticism was intended to be friendly and sincere, one feels a greater inducement to participate in the discussion on the report of the Fracture Committee. The comment of Mr. Eastwood and of Mr. McFarland that the statistical tables give no indication of the nature of the occupation is entirely justified. It could have been extended into a more powerful criticism that there is no differentiation in the age groups, no indication of the severity of the injuries nor of the incidence of complications. All of these omissions were recognized and were duly acknowledged in the report. Actually the information was available, and it was studied by the committee, but it would obviously have been a mistake to publish it in this report. Any surgeon who desires such information knows he can find it elsewhere in the literature. But none of these factors accounts for a difference of more than a week or two in the averages. Mr. McFarland's example of 400 Pott's fractures illustrates this. He says that "the average period of disability would be materially different in a series of 75 per cent. manual workers and 25 per cent. clerical" from a series of 25 per cent. manual workers and 75 per cent. clerical. The difference would be exactly ten days; the average in one series would be just over eleven weeks and in the other series just under ten weeks. No one is concerned with the difference between eleven weeks and ten weeks; we are concerned with the difference between eleven weeks and forty-seven weeks! I know that neither Mr. McFarland nor Mr. Eastwood would remain satisfied if they found that forty-four of their own cases of Pott's fracture were each incapacitated for almost a year. They would not defend the results on the grounds that their patients were manual workers. There would only be one explanation—that the cases had been badly treated.

Every correspondent has agreed that the main principles and recommendations of the report are sound, and although a casual reader of the letters of Mr. Eastwood and Mr. McFarland might not at first realize it, they also approve of the major features of the report. It is the more unfortunate, therefore, particularly in view of the heritage we possess in Liverpool, that anything should be done to obscure these main principles, and that minor criticisms should be so magnified that it can possibly be suggested that they are "rocks on which the report will founder." The report is in no danger of foundering; it has already done a great deal, and will continue to do more to further the objects which we all have in common.—I am, etc.,

Liverpool, April 2nd. R. WATSON JONES.

Properties of Ergometrine

SIR,—Since Dr. Chassar Moir and I published our account of the isolation of ergometrine (*Journal*, March 16th, p. 520) a new and very simple method of obtaining the drug has been evolved. This has enabled me to prepare several grams of the substance with which to proceed to its accurate chemical characterization.

The properties ascribed to ergometrine in the paper mentioned were presented with a reservation that some modifications might be necessary when the possession of a larger quantity permitted more drastic purification to be carried out. In order to prevent uncertainty or confusion among those who may be interested in the identification of ergometrine, I wish to correct the description of its behaviour towards methyl and ethyl alcohols, acetone, and ethyl acetate. It was stated that ergometrine could not be recrystallized from these solvents, and that evaporation of its solution in any of them resulted in a gum-like residue. This was true of the original crude ergometrine first isolated, but it has since been found that it no longer holds after the alkaloid has been purified by recrystallization, except, apparently, for methyl alcohol.—I am, etc.,

London, N.W.3, April 5th. H. W. DUDLEY.

Dr. Cheadle's Trip Across Canada

SIR,—Dr. Henry Robinson contributes to your issue of March 2nd, under the heading "Across Canada via the Rocky Mountains in 1863," an interesting summary of *The North-West Passage by Land*, published in 1864 by Viscount Milton and Dr. Cheadle. His suspicion that Cheadle is the author is fully verified by a publication he evidently has not seen, *Dr. Cheadle's Journal of a Trip Across Canada, 1862–63*, issued by Graphic Publishers Ltd., Ottawa, in 1931. This unexpurgated diary shows the relation between the two travellers to have been that of difficult patient and often outraged and exasperated doctor. It gives also details of disease conditions in the various settlements brought to the traveller doctor, and how he dealt with them.

"Went to the fort and got some sulphur for our itch. . . . Wretched old Cree with liver disease asks for rum. . . . English Cholera. . . . take Pulv. Cretu Cum Opio and smoke. . . . In the afternoon had a patient with chronic bronchitis. My deficient French very awkward. . . . Fetched after breakfast to see youth of 17 in epileptic fit, had them for five years. Thread worms: prescribed accordingly. . . . Fetched to view body of man found dead and supposed killed by horse . . . small lacerated wound on left temple, large discoloration of crown of head. Found lying forward."

But my real reason for writing is the extraordinary idea your contributor seems to have that the journey had geographical importance.

"In a real sense of the phrase, they were the begetters of the Canadian Pacific Railway, and deserve to be held in affectionate memory by all who travel from sea to sea on that system. Whether . . . Canadian provinces realize how much they owe to this gallant pair the members of the B.M.A.'s tour will be able to gather for themselves during the coming summer: either at Edmonton or Jasper House or at the divide of the Rocky Mountains there ought to be a memorial to them, if there is none already."

This is simply ridiculous, almost unthinkably ridiculous. Milton and Cheadle, an epileptic on tour in charge of a doctor, were amateur travellers, considered by the natives eccentrics who made their own difficulties, in a half-continent that professionals had already travelled through fairly easily and methodically for a century or more. Another such amateur pair were Lieutenant John Franklin and Dr. John Richardson in their unnecessarily terrible journey of 1819. In 1826, when given a "professional" trader-manager, Dease, they reported their sally to the Arctic as something like a picnic party. Cheadle was merely a burdened amateur traveller who wrote an interesting book and a much more interesting journal. If I were to set out, knowing nothing of Africa, to cross that continent in 1935, to shoot various animals I know nothing about, I would find myself in plenty predicaments to write about, though I would scarcely expect to be handed down to posterity along with Livingstone, Speke, or Grant, or even Stanley, as a real maker of geography. Yet my book might be worth reading, as Cheadle's two are—especially the journal.—I am, etc.,

Ninette, Manitoba, Canada, March 12th. D. A. STEWART.

Delayed Bleeding from Ruptured Spleen

SIR,—Since recent correspondence in the *British Medical Journal* shows that so few cases of delayed haemorrhage from ruptured spleen have been described, I feel that I ought to relate one.

My patient was a woman in the fifties, who was knocked down by a motor car and sustained a fracture in the region of the right ankle. She was removed to hospital, and although I made a careful examination for intra-abdominal injury that night and the following morning, I found neither symptom nor sign to suggest that any part of the body other than the leg had suffered as the result of the accident. During the next nine days, except for the fact that her temperature was usually raised to a figure varying from 98.8° to 100°, the patient appeared to be progressing normally.

On the morning of the tenth day, however, it was obvious that a large internal haemorrhage had occurred. Ruptured spleen was diagnosed, but owing to the desperate condition of the patient the surgeon considered it inadvisable to operate. The diagnosis was subsequently confirmed.

The chief points which impressed me were the long latent period, the absence before bleeding of any indication of abdominal injury, the pyrexia, and the fact that a long interval of time between injury and haemorrhage does not permit of a hope that bleeding from the spleen can be checked by other than operative procedure.—I am, etc.,

Willaston, Nantwich, March 26th. G. S. W. EVANS.

Forms of Tubercle Bacilli

SIR,—I have read with interest in the *Epitome* in your issue of February 9th (para. 132), the abstract of a paper by W. Steenken, W. H. Oatway, and S. A. Petroff on rough and smooth forms of the tubercle bacillus, which was published in the *Journal of Experimental Medicine* (October, 1934). The S colonies of human tubercle bacilli described by these workers, although more virulent than the R, seem, according to my experience, to be intermediate rather than true S forms.

For the last four years I have been studying the dissociation of tubercle bacilli, particularly those of the avian and human types, in the laboratory of Dr. William H. Park. I have had published in the *Proceedings* of the Society for Experimental Biology and Medicine for June, 1934, an article describing the successful dissociation of several strains of the human type from R to true S colonies. These S colonies are round, convex, smooth-edged, glistening rather than flat, diffuse, and wrinkled, and resemble not only the avian S colonies, but the S colonies of most other bacteria which have been dissociated.[1] I have also obtained true S colonies of the well-known human strain, H 37. Photographs of these will appear in a more extensive and detailed paper just completed.—I am, etc.,

ELEANOR ALEXANDER-JACKSON, M.A., Ph.D.

University and Bellevue Hospital Medical College, New York, March 20th.

Maternal Mortality

SIR,—The only way to get at the real cause of our high maternal mortality is to have a careful inquiry made in every case. It is not more unreasonable to hold an inquest on a case of death at childbirth than on a patient who dies during the administration of an anaesthetic. In each case death is abnormal. It is first of all necessary to know if there was anything in the patient's condition, either anatomical or otherwise, which might complicate matters; and secondly, it is of the utmost importance to know if there was any intervention, surgical or medical, and if so what was its nature and when made. Premature application of forceps, mistiming the administration of pituitrin and similar drugs, and too early and too forcible efforts to expel the placenta are examples of intervention which may have disastrous results.

Maternity cases are generally the most exacting and worst-paid forms of work a busy practitioner may have to do, and the policy of "wait and see" is not always very popular with the patient or her friends, who generally expect the doctor to "do something" to shorten her suffering. It is probable that the success of lying-in hospitals is due in great measure to the fact that the patient is removed from a circle of anxious relatives and friends, and placed under the care of trained women, whose calm demeanour inspires her with confidence and encourages her to bear her suffering with patience. One of the principal functions of ante-natal treatment should be to educate the expectant mother in the knowledge that childbirth is a natural process and not a disease, and need not be looked forward to with dread. The pains of labour are best relieved by chloroform, given by a Junker or similar inhaler. This method has been employed by physicians in Shanghai for the last forty years with unqualified success. The great advantage of this method is that administration can generally be left in the hands of the patient herself; it has no deleterious effect on the infant, nor does it have anything but a beneficial effect on the normal process of labour.—I am, etc.,

R. J. MARSHALL, M.D.,
Late Surgeon, British Consulate and Municipal Police, Shanghai.

London, S.W.1, April 7th

SIR,—Everyone interested in maternity work must have had food for thought from your leading article on maternal mortality in the *Journal* of March 30th (p. 653). It seems incredible that the experience of Rochdale can have been a coincidence. In the city of Bath we have a similar scheme to that in operation in Rochdale. Ten beds in the local Royal United Hospital (and more if required) belong—lock, stock, and barrel—to the Bath City Corporation, and in those beds the patients are treated either by their own doctors or by the maternity sister in charge, the hospital staff having no authority at all over them, apart from a general overriding respon-

[1] A reprint of Dr. Alexander-Jackson's paper can be seen in the library of the British Medical Association.

sibility for the whole block, unless called in in consultation. All these patients are subject to ante-natal vigilance in one way or another, possibly from their own doctor, possibly from the corporation ante-natal clinics, or possibly from the hospital obstetric out-patient department in consultation.

The point, however, which seems to be missed by nearly all who write upon this subject is the great, and sometimes extreme, difficulty of ante-natal work. The problem of *disproportion*, which is considered by many as almost synonymous with ante-natal care, is one of the *easiest* problems, at least, from the treatment point of view. Even though great authorities such as Mathews Duncan and Sir James Simpson discussed the matter in their writings fifty to one hundred years ago, ante-natal work has been taught as part of the medical curriculum for less than twenty years. It is fairly safe to argue that few medical men of 45 or over, unless they have expended much time and money upon their own re-education, can even now have much knowledge of the subject. And even if they have attended post-graduate courses, etc., unless they are attached to hospitals where they obtain intensive experience, how can any general practice in these days provide such experience when 50 per cent. or more of the midwifery is done by midwives, and with it the ante-natal care? Surely none but a knave or a fool would describe the work as easy, and with one-half (or more) of the medical profession completely untutored in the work, and the majority of the other half frankly and modestly admitting that they are groping with it, how can a miraculous revolution in maternal mortality be expected?

It seems to me that a good many years must necessarily elapse before the benefit of general ante-natal care can possibly be felt, and this period can hardly commence until the profession is generally trained in the work.—I am, etc.,

Bath, April 1st. DOUGLAS A. MITCHELL.

"Art and Fashion in Medicine"

SIR,—Two letters in your correspondence columns of March 23rd, one on "Art and Fashion in Medicine," the other on "Snake Venom in Therapeutics," refer to the employment of remedies in homoeopathic practice. As a member of what is sometimes referred to as the profession of "orthodox medicine," and not being myself gifted with the highly specialized personality equipment essential to successful homoeopathy, it may be of interest to others open to suggestion on the reactions of "potentized" remedies to record the following *ex parte* observations on the use of such reagents, regardless of any belief or disbelief in the Hahnemann theory. I will quote but two cases, both of panel patients now under observation.

The first was a woman of 33, complaining of a "swelling in the throat which nearly choked her," apparently one of a series of similar throat afflictions that had overtaken her repeatedly for the past fourteen years, and might, on that account, be held to be due to some constitutional defect rather than to be of purely local origin. There was nothing to be seen in the throat but an ill-defined patch on the posterior wall of the pharynx, but a week later, under the influence of potentized sulphur, which, of course, has a stirring effect on mucous membrane, this had assumed the appearance of a definite ulcer, and a sharply defined red border. During the next three weeks a higher potency of sulphur produced no appreciable change, although the symptoms were much relieved temporarily. But within a fortnight of two single weekly doses of potentized mercury it had cleared up completely, and the patient looked and felt perfectly well.

The second case was similar, in that potentized sulphur, given after an initial bowel inundation of dilute pure potassium permanganate solution, which had its usual immediate general effect, was followed by a chronic indolent ulcer on the shin of an old poliomyelitis limb in a boy of 19 taking on the characteristics of tuberculous ulcer, showing no tendency to heal, but which did heal up in fourteen days after one dose of potentized bacillinum and one of potentized tuberculin. This boy, I may add, averred that he had never been able in all his life to walk half a mile without being completely exhausted, and had never walked so far as a mile. Now he walks daily to and from his business, which is more than a mile from his home, without the slightest fatigue, and the excrutiatingly painful corns which formerly tormented his existence disappeared within a month or so of his taking potentized crude antimony.

If one doesn't mind, as I don't, being classed in what Hahnemann—in the most abusive volume ever aimed at orthodox medicine—refers to as the "mongrel sect," it may be that "public assistance" authority will still maintain its conservative attitude in the public interest, uninfluenced by appeal for preferential recognition of any special *modus operandi*, whether of homoeopathy, osteopathy, or the laying on of hands, whose claim for recognition and respect no one disputes, and will continue to allow, as it does now, complete freedom of action to anyone conforming to statutory requirement to practise whatever form of treatment he finds best.

I humbly suggest that the study of potentized reagents, with the notable exception of Schussler's exemplary analyses of the effects of some of them, is still in its infancy, and that, quite irrespective of the "like cures like" provings, the sooner they are put to the clinical test the sooner the objects of both your correspondents will be attained.—I am, etc.,

London, N.W.8, March 25th. F. A. HORT.

Treatment of Whooping-cough

SIR,—As a general practitioner living in a remote part of Ireland, I was especially interested in Dr. Benson's dissertation on the treatment of whooping-cough. However, in spite of my gratefulness for his extensive survey of the disease, I was rather disappointed in his suggested treatment. I think he might have made more of the addition of vitamins to his "importance of diet." Apart from a casual reference to orange juice (and to cod-liver oil in convalescence) he neglects to emphasize the necessity of vitamins A and D.

I happen to be the dispensary medical officer and M.O.H. to an area of over 100 square miles and a population of over 6,000 inhabitants. Recently I experienced an epidemic of pertussis. Most of the cases were unexceptional, but unfortunately I had three cases with deviations from the normal. Two were cases of bronchopneumonia, and one was pertussis with stomatitis. Not until I had ordered haliverol with the usual expectorant mixture did the patient show any abatement of symptoms. In fact, the addition of haliverol in one case showed such remarkably good results that I intend using it as a routine treatment in all others.

I would like to make one further suggestion, and that is that eucalyptus oil be sprinkled on the patient's pillow. This seems to give some relief in the spasmodic stage.—I am, etc.,

P. J. SMITH, M.B., B.Ch.

Drimoleague, Co. Cork, April 2nd.

Sinusitis and Epilepsy

SIR,—I was interested to read Dr. Pickworth's letter in the *Journal* of December 29th, 1934, regarding the causal relationship of sinus disease to epilepsy.

I have a boy, aged 20, who suffers from major attacks of epilepsy. He gets a definite attack of catarrh (with "stuffi-

ness," according to the mother, of the nose) twenty-four hours before an attack. Radiological examination showed very definite opacity of the right antrum, but no fluid level indicative of pus. This sinusitis was associated with nasal catarrh and enlarged unhealthy tonsils. The blood pressure was 145 systolic, 85 diastolic. The urine contained albumin.

Treatment was directed towards the eradication of these foci of infection. The tonsils were electro-coagulated and the nose treated by electrology. General auto-condensation treatment was given to counteract the raised blood pressure, and the kidneys were treated by diathermy. I have recently commenced treatment of the infected sinus by ultra-short-wave therapy.

There has been some improvement in his condition, the attacks becoming less frequent after treatment. Unfortunately the boy has to come into town from the country, which makes it difficult to give the necessary time to the case. The blood pressure is now 125, and the urine contains no albumin.—I am, etc.,

W. GORDON RICH, D.M.R.E.Camb.

Christchurch, New Zealand, Feb. 18th.

Fibrositis in General Practice

SIR,—In the issue of the *Journal* for April 6th Dr. Maxwell Telling deals in detail with the subject of "Fibrositis in General Practice," and from the treatment point of view he stresses the importance of massage. He states that in fibrositis massage is the only curative treatment, and demands its more extensive use, but it is unfortunate that he did not give more space to its correct technique. It is, I think, right to state that there are many highly qualified masseurs and masseuses whose teaching and technique are deficient when applied to the treatment of fibrositic thickenings, plaques, and nodules, and that for medical practitioners to refer fibrositis cases for treatment with the direction "massage" is wrong, and places upon the technician a responsibility which should be shouldered by the prescriber.

Time is opportune for the teaching of correct methods of massage in the treatment of the various forms of fibrositis, and it is essential that those who prescribe massage should understand its essentials. It should be clearly understood that, in general, massage is painless and soothing, but that its limitations, except as an aid to restoration of function and movement, are very definite. In fibrositis, if it is to be efficient and curative, it is frequently very painful, and in many instances may be followed by local discoloration, "bruising," which is not due to faulty technique, but is rather a sign of its correctness. To blame a masseuse for causing pain, increasing discomfort, or producing a marked local reaction in treating fibrositic conditions is not justified, but this is liable to happen until the proper technique for dispersing the fibrous thickenings, rubbing away nodules, and curing the condition is clearly understood. Much time and money is wasted by the continuance of methods of massage that are quite incapable of curing fibrositis, and in many cases the precedent application of heat or other physical methods of treatment, which are helpful auxiliaries, is completely overlooked.—I am, etc.,

Torquay, April 6th. K. R. COLLIS HALLOWES.

Sir Edward Sharpey-Schafer

SIR,—In the very sympathetic memoir of my father, written by Sir Leonard Hill in the *Journal* of April 6th (p. 742), he mentions the fact of my father's having taken the name of Sharpey, and I feel I must contradict the reason he gives for this.

My father was very proud of his German origin, and especially of his grandfather, who had been a distinguished musician in Hamburg. At the beginning of the war some of our friends suggested we should change our name, but my father always firmly refused, and never took the slightest notice of any criticism levelled at him owing to his name. The name Sharpey had been given, as a second name, to my elder brother, who was killed in the spring of 1918, and my father was anxious, as Professor Sharpey had left no known descendants, to perpetuate the name and link it for all time with physiology as a tribute of gratitude and affection to the man who had first inspired him in his life-work.

I should be much obliged if you would print this explanation, as I should not like his motive to be misunderstood by his many friends.—I am, etc.,

North Berwick, April 8th. G. M. SHARPEY SCHAFER.

Strickland Goodall Memorial

SIR,—Dr. Joseph Strickland Goodall died towards the end of last year at the early age of 59. His memory is revered by many who benefited not only by his skill, but also by his great capacity for friendship and by his ungrudging and willing service. He was a man with a large and generous mind. It is therefore desired to perpetuate his memory, and we feel sure that there must be many among his professional colleagues, friends, and patients who would wish to co-operate with us.

We are of the opinion that the form of memorial he would have preferred would be a lectureship and medal named after him. This lecture would embrace cardiology in its widest sense. Dr. Strickland Goodall was an examiner for the Society of Apothecaries for many years, and in view of his close association with the company we think it appropriate that the lectureship and medal should be under its auspices. The Court of Assistants has graciously consented to act as trustee.

We should be glad if all those who feel they would like to contribute would send their contributions to the Treasurer, "Strickland Goodall Fund," Westminster Bank, Harley Street, W.1.—We are, etc.,

DOROTHY ST. CYRES.
R. L. HARMSWORTH.
JAMES BERRY.
CHARLES CARPENTER.
JOHN COHEN.
A. W. SHEEN.
J. W. EYRE.
GEORGE JOSEPH.
RUSSELL J. REYNOLDS.
D. EVAN BEDFORD.
BERTRAM MENDLESON.
MAUDE RICHARDS.
LAMBERT ROGERS.
T. JENNER HOSKIN.

London, April 2nd.

"Sex Ethics"

SIR,—No more thorough vindication of the wisdom of writing *Sex Ethics* could be found than in the opening sentences of your reviewer's notes on our book (March 9th, p. 474). It is on account of the neglect by the medical profession of such subjects as contraception, and by this attitude of refusing (whether owing to ignorance or not) to give advice on sexual matters, that these subjects have fallen into the hands of unqualified and irresponsible writers.

Hasty perusal not infrequently leads to equally hasty conclusions, an example of which is afforded by your reviewer's criticism of the method of sterilization advocated in the case of haemophiliacs. A more careful perusal would have shown that the method recommended is irradiation, and not operation.—We are, etc.,

JOHN ELLISON.
A. GOODWIN.
CHARLES D. READ.
LOUIS CARNAC RIVETT.

London, March 30th.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The House of Commons spent four more days this week in committee on the Government of India Bill. Clauses governing the conditions of employment and remuneration and pensions of members of the Civil Service were debated.

The Superannuation Bill was reported with amendments from a Standing Committee of the House of Commons on April 9th.

The Royal Assent has been given to the County of Holland Joint Hospital District Act, the Guisborough Joint Small-pox Hospital District Act, the Huntingdonshire Joint Hospital District Act, and the South Chilterns Joint Hospital District Act.

In the House of Lords, on April 9th, the Land Drainage (Scotland) Bill was read a second time. The Army and Air Force (Annual) Bill was read the third time and passed.

Maternal Mortality

During the debate on health services in the House of Commons on March 25th, Captain G. S. ELLISTON spoke on maternal mortality. Dr. O'Donovan had said this was a medical question. Captain Elliston, as one born and bred in the medical profession and engaged in public health administration, did not agree with this. It was no good suggesting that local authorities had been wholly negligent of their responsibilities. Between 1930 and October, 1934, the proportion of expectant and nursing mothers who sought the assistance of clinics provided by local authorities rose from 27.8 to 42.2 per cent. Dr. O'DONOVAN asked if Captain Elliston implied that over 50 per cent. were not seeking advice from competent established general practitioners in the district. Captain ELLISTON: Certainly not. Numbers of the population do have the assistance of their family doctors, but a large number fail to avail themselves of the expert assistance placed at their disposal by local authorities. That is deplorable. Captain Elliston advised the Minister of Health to press local authorities to subsidize midwives for necessitous women. The "handy woman" was responsible for many of the accidents of childbirth. The Minister could satisfy himself that there had been no lack of enterprise on the part of medical officers in applying the measures necessary to deal with maternal mortality. Had the field of necessary research been planned and covered by the Ministry of Health? Dr. Janet Campbell desired investigation into puerperal sepsis in the home and in the hospital; into nutrition during pregnancy, including the effect of vitamins, drugs, and foods and into the alleged increase of abortion. Captain Elliston had met doctors, especially in the North of England, who believed abortion was one of the greatest causes of maternal mortality to-day. The British Medical Association had brought the matter to the attention of the Ministry of Health. Had it been pursued further? Again, they should inquire into the increasing vogue of birth control and the effects which might result from the growing use of contraceptives—a possible cause of infant mortality. Overstrain and fatigue of mothers resulting from unemployment called for immediate investigation. Finally, he would like the Minister to conduct an investigation into the safety of milk as food for mothers and children. Medical officers of health knew that the milk supplied to the people was a matter of suspicion, and often a real danger. The House should give the Ministry all support in going ahead with the necessary investigation and research.

Nutritional Value of Milk

On April 1st Dr. ELLIOT informed Mr. Cove that the Milk Marketing Board for England and Wales and the Scottish Milk Marketing Board had submitted to the Secretary of State for Scotland and himself particulars of certain arrangements for conducting an inquiry into the nutritional value of milk. These arrangements had now been approved for the purpose of Exchequer contributions under Section 11 of the Milk Act, 1934, and in accordance with the provisions of the section had been laid before Parliament and were now available to the House. The scheme was supplementary to the milk-in-schools scheme, and it was hoped that the information which would be collected would not only be of great value to those engaged upon nutritional research and in connexion with public health and education services, but would have an important bearing upon the problem of increasing the demand for liquid milk in this country. The inquiry was under the supervision of a representative expert subcommittee of the Advisory Committee on Milk Publicity of the Milk Marketing Board for England and Wales, and was being conducted by experienced medical officers working in conjunction with school medical officers and teachers. It was on a large scale, covering some 8,000 children, and was expected to last for some twelve months.

Private Nursing and Maternity Homes

On April 1st Mr. E. WILLIAMS asked the Minister of Health the number of private maternity and nursing homes in the country, and the number that were registered and came under local government supervision. Mr. SHAKESPEARE said that the administration of the Nursing Homes Registration Act, 1927, was in the hands of the local supervising authorities established under the Act, usually the councils of counties and county boroughs, and the information desired by Mr. Williams was not in the possession of the Minister. He pointed out, however, that under the Act all private maternity and nursing homes, with certain specified exceptions, had to be registered by, and were subject to inspection by, the local authority.

Mr. Shakespeare also informed Mr. Williams that according to the returns received from local authorities in England and Wales for 1933, the numbers of deaths during the year of mothers and children in their maternity hospitals and in the maternity wards of other hospitals and institutions administered by them were as follows: 607 maternal deaths and 2,243 deaths of infants within ten days of birth. Complete figures for 1934 were not yet available.

Yellow Fever in West Africa

In reply to Colonel Heneage, on April 3rd, Sir PHILIP CUNLIFFE-LISTER said yellow fever was endemic among the natives of West Africa, and thus it was not, strictly speaking, correct to refer to an "outbreak of yellow fever." During the past few months cases had been reported from each of the four West African Dependencies. In Gambia the first case diagnosed as one of yellow fever (European) proved fatal on October 6th, 1934, and, later, three other Europeans succumbed. Three African cases were also notified, one of which proved fatal. The usual precautions were taken to deal with this situation, and the Island of St. Mary was placed in quarantine. The order declaring the Island an infected district was cancelled on January 18th, since when no further cases had been reported. In this connexion he referred to a reply which he gave on December 21st, 1934, to a question by Mr. D. Grenfell. Between November 21st and January 15th five African cases of yellow fever were notified from the Gold Coast, of which two proved fatal. On December 24th it was reported that two Europeans were suffering from yellow fever in Kano in Northern Nigeria, but both had since recovered. Previous to this, three Europeans had died at Kano, and it was suspected that they were suffering from yellow fever. A number of African cases, of which one was fatal, were also notified, and the usual precautions were taken to prevent the spread of infection. On January 21st a suspected case of yellow fever, which was later confirmed, was reported from Sierra Leone. The victim in this case was a European, who died on January 26th. He was able to say that no new cases had occurred since the middle of January. To combat this disease in Gambia, assistance was obtained, in the first place, from the Gold Coast and from Sierra Leone. He took this opportunity of expressing his thanks and the gratitude of the Government of Gambia to Dr. Howells of the Gold Coast, and to Dr. Davey

and Dr. Duncan of Sierra Leone, for the zeal and energy with which they handled a difficult situation, and to the Wellcome Research Institution, which kindly gave permission for Dr. G. M. Findlay to visit Bathurst to conduct inoculations against yellow fever. The Governor reported: "Apart from the inoculations (152 persons in all were successfully inoculated), Dr. Findlay worked tirelessly, investigating the cause and extent of the outbreak, and also gathering a mass of data relating to the incidence of yellow fever and other diseases for scientific examination in London. It would be difficult to express our thanks too warmly or to exaggerate the importance to West Africa of the conclusions to be drawn from his work here."

The Increased Cost of Milk to Institutions

Replying to Mr. Burnett, Sir GODFREY COLLINS said he had received a report from the Committee of Investigation for Scotland regarding the price of milk to institutions. The report was under consideration. The committee found that local authorities and voluntary hospitals within the area of the Scottish milk scheme were now required to pay substantially more for their supplies than they paid before the inauguration of the scheme. The price scale determined by the Board, and its action in giving effect to it, might be regarded as contrary to the interests of the said local authorities and of voluntary hospitals. On the question whether the determination of the Board in this matter was not in the public interest, the committee found itself unable to give an unqualified answer. The committee had no hesitation in deciding that the beneficent nature of the work carried out by the local authorities and the voluntary hospitals did not in itself justify a claim to obtain their supplies of milk under the scheme at less than a reasonable price. On the other hand, the committee pointed out that it would be an unfortunate sequel to the scheme if the consumption of Grade A (T.T.) Milk were abandoned to any extent in hospitals or in rate-supported institutions in favour of ordinary milk, and equally unfortunate if the consumption of milk, of whatever grade, were to be reduced. This consideration, coupled with the facts that the institutions are large consumers and did not purchase for trading purposes or for sale at a profit, that there was little expense involved in handling or distribution, and that there was no risk of any bad debts being made by the sellers, suggested to the committee that there was a case for exceptional treatment of these institutions. In so far as these institutions had not received such treatment owing to the action of the Board, such action may be said to be not in the public interest.

On April 13th the LORD ADVOCATE informed the Duchess of Atholl that an Order would now be made to give effect to the proposal of the investigating committee into the Scottish milk marketing scheme that the contribution payable in respect of certified milk sold as such should be at the rate of one halfpenny a gallon, with retrospective effect as from May 1st, 1934.

Food for Nursing Mothers.—Sir HILTON YOUNG, on March 27th, informed the Countess of Iveagh that according to his latest information 275 local authorities in England and Wales had made arrangements, under the Maternity and Child Welfare Act, 1918, to provide food, other than milk, to expectant or nursing mothers. The food was supplied free or at less than cost price in necessitous cases by 214 of those authorities.

Police Recruits.—On March 28th Sir JOHN GILMOUR informed Sir W. Jenkins that in 1933 8,027 persons completed application recruiting forms for the Metropolitan Police, and of these 70 per cent. were rejected as being below standard. Recruits attending for examination numbered 1,682; 46 per cent. were rejected on medical grounds and 20 per cent. on other grounds. In 1934, of 5,893 applicants 51 per cent. were rejected as below standard; of 2,415 who attended for examination 47 per cent. were rejected on medical and 19 per cent. on other grounds. From January 1st, 1935, to March 23rd, 1935, of 1,373 applicants 42 per cent. were rejected as below standard, and of 724 recruits attending for examination 54 per cent. were rejected on medical grounds and 16 per cent. on other grounds.

Royal Veterinary College.—On April 1st Dr. ELLIOT informed Sir A. McLean that the governors of the Royal Veterinary College had accepted in principle the recommendations contained in paragraphs 44 and 45 of the report of the Departmental Committee, on the reconstruction of the college. Action, however, had been deferred until the rebuilding of the college was approaching completion. He understood that the governors had recently been advised that it would be necessary for them to apply for a new charter, and that a draft was in course of preparation.

Standardization of Lifts.—Sir JOHN GILMOUR told Sir A. Wilson, on April 1st, that he understood that a committee had been set up by the British Standards Institution, in consultation with lift makers and others, to prepare standard specifications for lifts, but that the modernization of all existing lifts would be a difficult and very costly matter. He was exploring the situation, and would be communicating with the Lift Makers' Association.

"Twice-Pasteurized" Milk.—Replying to Major Mills, on April 4th, Mr. SHAKESPEARE said it was undesirable that milk should be heat-treated more than once. He was not aware that it was collected at country depots at considerable distances from London, pasteurized there, and then transported to London in bulk and pasteurized again to nullify the effects of contamination and deterioration before being bottled. It was one of the conditions of the sale of milk as "pasteurized" that the milk should not be heated more than once. If evidence of an infringement could be supplied, he would bring it to the notice of the appropriate local authority.

Malnutrition in County Durham.—Replying on April 4th to Mr. Batey, Mr. SHAKESPEARE said the report regarding the condition of children suffering from malnutrition in the county of Durham was being printed with a view to publication. The question of action on the findings was under consideration.

"Accident Proneness" Inquiry.—Mr. HORE-BELISHA told Captain Erskine-Bolt, on April 4th, that arrangements had been made for a conference between representatives of the Medical Research Council and of authorized insurers for informal discussion of the paragraphs in the report of the Medical Research Council (Cmd. 4796), which dealt with "accident proneness" and road dangers.

Present Position of Water Supplies.—On April 8th Mr. SHAKESPEARE, replying to Mr. Cleary, said that the average total rainfall for the country as a whole for the six months ended March 31st last, the critical months for the replenishment of water supplies, was above the normal, and urban water undertakers generally were in a good position. Should the necessity arise, powers were available to them to obtain additional water supplies with dispatch under the Water Supplies (Exceptional Shortage Orders) Act, 1934, which remained in force until the end of the present year.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Applications for the John Lucas Walker Studentship, the holder of which shall devote himself (or herself) to original research in pathology, should be sent, accompanied by copies of papers containing published work, testimonials, and references, before July 15th, 1935, to Professor H. R. Dean, M.D., Department of Pathology, to whom also applications for further information regarding the studentship may be addressed. The studentship is of the annual value of £300, and is tenable for three years.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—B. Anderson, S. M. Basu, N. A. Bicchieri, J. L. Wreddon.

MEDICINE.—W. C. Campbell, O. A. L. Goode, A. Ponder.

FORENSIC MEDICINE.—S. M. Basu, R. N. Crossley, N. H. E. de St. Dalmas, O. A. L. Goode.

MIDWIFERY.—R. H. Bembridge, S. E. Osborne, H. V. Sansom.

The diploma of the Society has been granted to H. V. Sansom.

UNIVERSITY OF ABERDEEN

The following degrees were conferred on April 3rd:

HON. LL.D.—Lieut.-Colonel Andrew Thomas Gage, C.I.E., M.B., C.M., I.M.S. (ret.) (*in absentia*); John Charles Grant Ledingham, C.M.G., M.B., F.R.C.P., F.R.S. Professor of Bacteriology, University of London, and Director of the Lister Institute, London.

M.D.—*H. Livingston, J. MacLeod.

M.B., CH.B.—†‖G. M. Stephen, ‡‖W. G. Mackinnon, E. G. G. Rhind, L. F. C. Berlinguet, W. Burns, N. J. Craig, W. R. Darnley, R. Fraser, W. R. Gauld, J. P. B. Gill, Evelyn W. Glennie, S. T. G. Gray, R. W. B. Greig, J. S. Johnstone, A. M. Keith, J. McI. D. McIntosh, Elizabeth Martin, P. L. Masor, W. Michie, R. B. Rait, A. I. Ross, J. S. Simmers, R. S. Slessor, Marie S. Sutherland, A. Watt.

D.P.H.— W. F. Gapper, Sheila Thomson.

* Commended for thesis. † First-class honours. ‡ Second-class honours. ‖ Passed final medical professional examination with distinction.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At the monthly meeting of the College, held on April 5th, the following successful candidates at the Conjoint Final Examination with the Royal College of Surgeons in Ireland were admitted to Licences in Medicine and Midwifery: B. E. Betty, H. J. Conway, Eva Dolan, J. M. Fitzpatrick, J. W. Heydon, R. Kearney, W. Kyle, J. H. St. G. Lucas, H. F. Moffit, D. H. McDowell, Elizabeth M. O'Connor, R. G. B. Wigoder.

The meeting agreed to a suggestion from the registrar of Sir Patrick Dun's Hospital, Dublin, that the College should send representatives to a further conference on the proposed agreement with Trinity College and the board of the hospital.

The Services

AUXILIARY R.A.M.C. FUNDS

The annual meeting of the members of the Auxiliary R.A.M.C. Funds will be held at 5.15 p.m. on Friday, April 26th, at 11, Chandos Street, Cavendish Square, W., when the annual report and financial statement for the year ended December 31st, 1934, will be presented, and the officers and committee for the current year elected.

INDIAN MEDICAL SERVICE

The annual dinner will be held at the Trocadero Restaurant, London, on Wednesday, June 19th, at 7.15 p.m. Major-General E. A. Walker, C.B., K.H.S., Director Medical Services, India, will preside. Officers can arrange to sit near their friends, as separate tables to seat eight will be provided. Tickets from the joint honorary secretary, Sir Thomas Carey Evans, Hammersmith Hospital, Ducane Road, W.12.

DEATHS IN THE SERVICES

Colonel William Thomas Mould, C.M.G., late R.A.M.C., died at Folkestone on March 18th, aged 69. He was born at Forton, Gosport, on July 12th, 1865, the eldest son of Colonel J. S. Mould, R.M.L.I., was educated at the London Hospital, and took the M.R.C.S. and L.R.C.P.Lond. in 1887. After filling the post of house-physician at the London Hospital, he entered the Army as surgeon on February 1st, 1890, becoming lieutenant-colonel on May 8th, 1912, and full colonel in the long war promotion list of March 1st, 1915. He retired on October 10th, 1919. He served in West Africa, in the Sierra Leone campaign in 1898–9 (medal with clasp); in South Africa, throughout the Boer War of 1900–2; with the Irish Hospital, when he took part in operations in the Transvaal, in the Orange River Colony, and in Cape Colony; was mentioned in dispatches in the *London Gazette* of September 10th, 1901, and received the Queen's medal with three clasps and the King's medal with two clasps; and in the war of 1914–18, when he was mentioned in dispatches in the *London Gazette* of August 27th, 1916, and received the C.M.G. He married Amy, daughter of Mr. J. O'Brien, and had one son.

Lieut.-Colonel Douglas Richard Green, Bengal Medical Service (ret.), died at Valescure, France, on March 16th, aged 66. He was born on June 20th, 1868, the son of Isaac Green, Esq., Middlesex, and was educated at University College, London, graduating M.B., B.S., and M.D. of London in 1892. He entered the I.M.S. as surgeon lieutenant on July 27th, 1892, became lieutenant-colonel after twenty years' service, and retired on August 1st, 1912. He served in the Tirah campaign, on the North-West Frontier of India, in 1897–8, and was present at the actions of Chagru Kotal, Dargai, the Sampagha and Arhanga Passes, and the operations around Dwatoi and the Bara Valley, and received the frontier medal with two clasps. During the war of 1914–18 he rejoined for service in India.

Lieut.-Colonel James Entrican, C.I.E., Madras Medical Service (ret.), died at Beckley, Sussex, on March 18th, aged 71. He was born on September 2nd, 1864, the son of Samuel Entrican of Londonderry, was educated at Belfast, and graduated B.A. in 1885, and M.D., M.Ch., and M.A.O. of the Royal University of Ireland in 1887. Entering the I.M.S. as surgeon on July 28th, 1891, he became lieutenant-colonel after twenty years' service, and retired on March 27th, 1923. He served in the Burma campaign in 1891–2, receiving the medal, and in China in 1900 (medal). He received the C.I.E. on January 1st, 1922. In 1905 he married Amy Mary, daughter of Dr. G. E. Yarrow.

Lieut.-Colonel Frank Cecil Clarkson, Bengal Medical Service (retired), died at Hove on March 14th, aged 72. He was born on May 27th, 1862, the son of Major James Price Clarkson of the Indian Army, was educated at St. Thomas's, and took the M.R.C.S. and L.R.C.P.Lond. in 1885. Entering the I.M.S. as surgeon on September 30th, 1886, he became lieutenant-colonel after twenty years' service, and retired on March 1st, 1912. He served in the Lushai campaign of 1889–90 (medal with clasp); in the Manipur campaign of 1891 (clasp); and in the Burma campaign of 1891, with the Thetta column (clasp). Most of his service was passed in civil employ in Bengal, where he ended his service as Sanitary Commissioner. After retirement he rejoined for service at home during the war of 1914–18. He was a younger brother of Lieut.-Colonel J. W. Clarkson of the Bombay Service, who died in 1909.

Lieut.-Colonel Selby Herriot Henderson, Bengal Medical Service (retired), died at Cheltenham on March 17th, aged 73. He was born on March 28th, 1861, the son of John Henderson of Gordon, Berwickshire, was educated at Edinburgh University, where he graduated M.B. and C.M. in 1882, and entered the Indian Army as surgeon on September 30th, 1886, became lieutenant-colonel after twenty years' service, and retired on April 5th, 1919. Most of his service was spent in civil employ in the United Provinces, in the Jail Department.

Lieut.-Colonel Thomas Archer, R.A.M.C. (ret.), died at Lydd on February 15th, aged 79. He was born at Caledon, County Tyrone, on December 21st, 1855, and was educated at Belfast, where he graduated M.D., M.Ch. in the Royal University of Ireland in 1876. Entering the Army as surgeon on February 5th, 1881, he became lieutenant-colonel after twenty years' service, and retired on February 6th, 1904. He served in the Sudan campaign in 1898, on the Nile, and received the medal and the Egyptian medal; and in the South African War from 1899 to 1902, taking part in operations in the Transvaal, the Orange River Colony, and in Cape Colony, and received the Queen's medal with three clasps and the King's medal with two clasps. After his retirement he was employed at Lydd, and also rejoined for service, from April 4th, 1915, in the war of 1914–18.

Surgeon Captain Sidney Roach, R.N. (ret.), died at sea on March 25th. He was educated at Bart's, and took the M.R.C.S., L.R.C.P.Lond. in 1897, and later also the D.T.M. Lond. in 1921. He entered the Navy on May 25th, 1897, became staff surgeon in 1905, surgeon commander on May 25th, 1911, and retired, with an honorary step as surgeon captain, on January 1st, 1924. At different times in his service he had served in the Bermuda naval hospital, in the garrison of Ascension, and at Chatham barracks. During the war he was medical officer of the cruisers *Devonport* and *Roxburgh*, and of the submarine depot ship *Bonaventure*. After the war he was medical officer of the Royal Naval College and the Royal Hospital School at Greenwich. After leaving the Service he went as medical officer of one of the Harrison Line steamers.

Major Henry Talbot Baylor, R.A.M.C. (ret.), died at Ash, Canterbury, on March 30th, aged 76. He was born in 1859, was educated at Trinity College, Dublin, and took the L.R.C.S.I. and L.K.Q.C.P. in 1884. Entering the Army as surgeon in 1885, he became surgeon major after twelve years' service, and retired in 1905. He served in the Nile campaign of 1898, gaining the medal and Egyptian medal, and in the South African War, 1900–2, taking part in operations in the Transvaal, the Orange River Colony, and Cape Colony, including the actions at Karee Siding, Vet River, Zand River, and Johannesburg, and received the Queen's medal with three clasps and the King's medal with two clasps.

Obituary

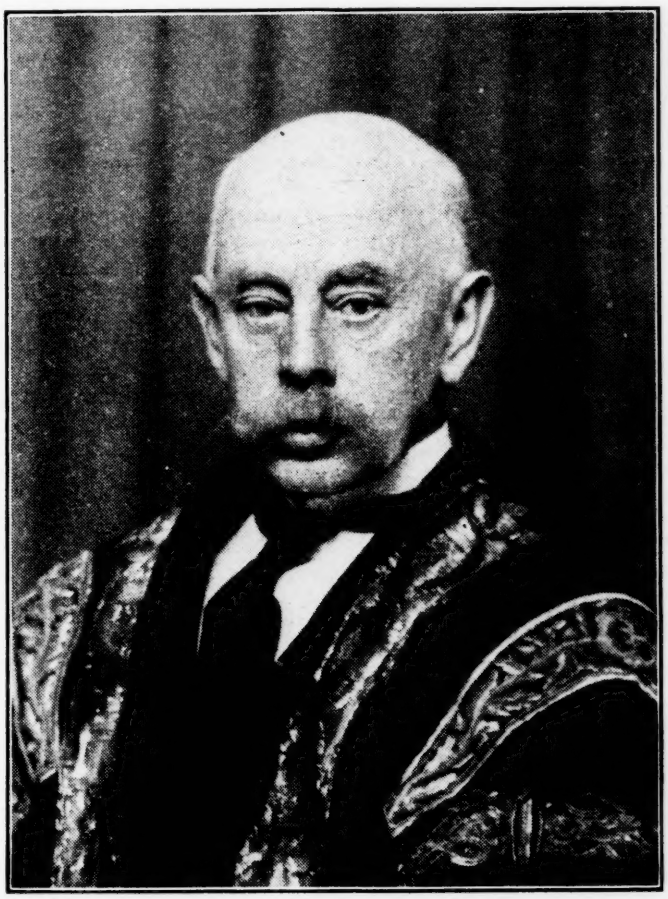
SIR JOHN ROSE BRADFORD, Bt., K.C.M.G.

C.B., C.B.E., M.D., F.R.S., F.R.C.P.

Past President of the Royal College of Physicians of London

We much regret to announce the death on April 7th, at his home in Manchester Square, W., of Sir John Rose Bradford, consulting physician to University College Hospital, who was President of the Royal College of Physicians of London from 1926 to 1931, and had long been a leading figure in the medical and scientific world of this country.

John Rose Bradford, the son of Abraham Rose Bradford, was born in London on May 7th, 1863. He was educated at University College School, the College itself, and, for his medical work, at the associated hospital. With a scientific type of mind he gained the Lewes studentship in physiology, and devoted considerable time to experimental work on this subject. He took the B.Sc.Lond. degree before qualifying for practice with the M.R.C.S. diploma in 1886. Continuing with his scientific work he took the M.B. and D.Sc. degrees of London University in 1888, and next year obtained the doctorate in medicine with a gold medal. After graduating he acted as demonstrator of anatomy at University College Hospital Medical School, and after holding resident posts was elected to the visiting medical staff of the hospital.



Early scientific work was done with Professor Bayliss at University College laboratory on electrical changes in secreting glands. He contributed several papers in the *Journal of Physiology* from 1885 to 1899, either by himself or with his co-workers. They were on electrical phenomena accompanying secretion; on the action of drugs on the circulation and secretion of the kidney; and on innervation of various blood vessels. Important papers were on the results following partial nephrectomy, and the influence of the kidney on metabolism. His scientific observations and contributions to its *Proceedings* led to election to the Fellowship of the Royal Society, and he took an active part in its administration, serving as secretary from 1908 to 1915. In 1898 he published a small work *Clinical Lectures on Nephritis*. It consisted of reprints of nine papers contributed to the *Clinical Journal*, and was characterized by clearness of description and accuracy of observation. It was a useful and concise account of the subject, chiefly designed for students, and might have been added to with advantage.

Rose Bradford contributed several important articles to Allbutt and Rolleston's *System of Medicine*. In vol. iii he revised Sir William Roberts's section on gout and C. H. Ralfe's on diabetes insipidus. He wrote the article on general physiology and pathology of secretion. In this he referred to experiments performed by himself on the excretory functions of the kidney, which showed that after removal of the greater part of both organs excretion not only continued undiminished but the amounts of urine and urea might actually be increased; further, that this disordered metabolism might lead to great wasting and marasmus, followed by death—a train of events which he thought might possibly be due to the arrest of some normal internal secretion. In vol. v are two important articles on the general pathology of the renal function and of renal disease, and on nephritis. The former paper is lengthy, extending to more than fifty pages, and is on the functions of the kidney in health and disease. In it he records some of his own experimental work. It is a very thorough study of the subject. The paragraph on physiological and postural albuminuria states views which have been but little changed in the twenty-five years since it was written, and is well worth studying now. He refers to his own observations on the effect of division of the renal plexus on the urinary outflow in the normal kidney and again states his opinion that the kidney, perhaps by some internal secretion, has some action in metabolism as well as its chief excretory function. In writing of uraemia he tells how, after removal of part of a kidney in experimental observation, although the watery urea output is usually not only undiminished but may even be increased, there still remain very large quantities of urea and other nitrogenous extractives in the blood and tissues. This, he suggested, was due to rapid degeneration of the protein tissues, and might explain the production of clinical uraemia, although he found no similar symptom in his laboratory experiments. The section on nephritis is an equally exhaustive consideration of its subject. It was really a restatement of his views as published in the four Croonian Lectures, delivered at the Royal College of Physicians in 1904, on "Bright's Disease and its Varieties." The lecture subjects were: (1) physiological considerations, (2) action of toxic agents on the kidney, (3) nephritis and acute Bright's disease, (4) chronic Bright's disease.

In 1904 he went with the Mosley Commission to study educational methods in the United States. He took the medical aspects of the subjects and W. H. Gaskell the anatomical and physiological. His share of the report dealt with the relation of hospitals to medical schools, clinical laboratory organization, and the teaching of medicine and pathology.

During the war he acted as consulting physician to the British Expeditionary Force in France, with the rank of major-general, A.M.S. He was senior medical adviser to the Colonial Office in London for some years. In 1924 he contested the seat in Parliament for the University of London in the Conservative interest, but was unsuccessful.

For many years he was an outstanding figure in the Royal College of Physicians. He became a member in 1892 and was elected to the Fellowship in 1897. He filled, for a time, its various administrative posts, and was rewarded by being elected as President for the years 1926–31, in succession to Sir Humphry Rolleston. He delivered its Goulstonian Lecture in 1898, the Croonian Lectures in 1904, and the Lumleian Lectures in 1920. The Lumleian Lectures were on the clinical experiences of a physician during the campaign in France and Flanders, 1914–18. They were a short description of some of the clinical manifestations of disease which he had the opportunity of observing while acting as consulting physician to the British Expeditionary Force. They were little more than a record of some impressions ; a survey of a more or less cursory character of the observations of very large numbers of cases of diseases of very different and varied nature. He dealt more particularly with the diseases from the standpoint of general medicine rather than with the special diseases directly related to the operations of war itself, such as trench fever and gas affections. The last lecture dealt with gunshot wounds of the chest—penetrating and superficial.

He received many honours for his distinguished service to science and medicine: K.C.M.G. in 1911, C.B. (military) in 1915, C.B.E. after the war in 1919, and was created a baronet in January, 1931. He also received honorary degrees from the Universities of Edinburgh, Durham, Dublin, Cambridge, and Christiania, and the Royal College of Physicians of Edinburgh made him an honorary Fellow. In 1932 he was elected president of the London and Counties Medical Protection Society. At the annual meeting of the British Medical Association in 1891 he was secretary of the Section of Therapeutics, and when the Association met at Toronto in 1906 he was vice-president of that section.

He married in 1899 Mary Roberts, O.B.E., daughter of Thomas Ffoulkes Roberts, one-time mayor of Manchester, and brother of Sir William Roberts, in whose work Rose Bradford was keenly interested.

[The photograph reproduced is by Elliott and Fry, Ltd.]

Sir Humphry Rolleston writes:

Rose Bradford, whom I first met in January, 1887, at a meeting of the Physiological Society, when we were both assistant demonstrators of anatomy in different places, was a man of infinite variety—a prominent physiological worker, a physician with accelerated promotion to the staff of University College Hospital, Professor Superintendent of the Brown Institute, Fellow and biological secretary of the Royal Society, and such a capable man of affairs that he was chairman or a member of innumerable committees and an adviser on medical and scientific problems to bodies with varied objectives, such as the Colonial Office, the Medical Department of the Admiralty, and the Grocers' Company. His abilities and personality much impressed his seniors and contemporaries ; indeed, Charles James Fox's *bon mot*, "No man ever was so wise as Thurlow looks," was adapted to him by his friends. Of these he had a wide circle, especially among the leaders in science, such as Sir Michael Foster, Sir Archibald Geikie, and W. H. Gaskell, and many of his friends sought his advice about their own health. But in addition to these activities he had a number of outside interests: he was a lover of the country and its sporting amenities, and a very "clubbable" member of several small dining fraternities, where it was pleasant to sit next to such a talented raconteur with a keen though not boisterous sense of humour.

There is reason to believe that he was sounded about a chair at Cambridge, and he probably hesitated about the nature of his life's work until he was elected assistant physician to University College Hospital, for he was rather late in becoming a member of the Royal College of Physicians, of which he was elected Fellow in 1897 and President twenty-nine years later. He was a general physician of both a scientific and thoroughly practical type, but it is even more as a man of the highest ideals and character that many are now thinking of him who has just "crost the bar."

Dr. Herbert Spencer writes:

The death of Sir John Rose Bradford, though not unexpected, is a great loss to University College Hospital and the whole medical profession, and an irreparable blow to his many friends. Having known him for more than half a century, both as colleague and friend, I can testify to his admirable personal qualities, some of which were shown only to those who were really intimate with him. His pre-eminent gifts were honesty and devotion to duty, clearness of exposition, a marvellous memory, and a keen sense of humour. His devotion to duty was shown in the regularity of his visiting and teaching at the hospital, and in the many public offices which he filled. He was an ideal chairman of a committee ; his retentive memory and clear intellect enabled him to place the true position before the meeting and to check irrelevant discussion. The same qualities rendered him an excellent teacher. Brought up in the school of Jenner and Ringer he was a conscientious clinician, conducting the examination of the patient with thoroughness and gentleness. He used to relate with pride that his war colleagues declared that they could recognize a U.C.H. man by the way in which he examined the patient. At his visits to the hospital wards, after a thorough clinical examination, he proceeded to discuss the case, usually ending with the question "Have I made that clear?" ; and the class was unanimously of the opinion that he had.

Bradford was a dignified and upright gentleman, averse from all forms of advertising and commercialism. He had a very soft heart and a charitable disposition, and was a great lover of children. He was fond of natural history (especially ornithology) and shooting. In former days he used to go to Ireland and Sark for sea-fishing, and for many years his Christmas shooting-parties at "Bryn" have delighted his chosen friends and pupils. He was well versed in the French language, which he had learnt as a boy in Bruges: he was consequently on intimate terms with his French colleagues in the war, who introduced him to some of the finer developments of French cookery. He used to relate, with a smile, how one of those colleagues said, "*j'aime un peu de couleur dans ma cuisine.*" Bradford extended his studies to "*la physiologie du gout,*" and had excellent taste in wine and food. His *petits pois*, imported from France, were a great delicacy, and he brought to my notice the excellence of that once favourite bird, the godwit. Very pleasant memories gather round that Welsh home where he and Lady Bradford dispensed such charming hospitality, and with sorrowful hearts we shall think of him at rest in that little churchyard at Llanymawddwy, near "Bryn," which he loved so well.

Sir StClair Thomson writes:

The obituary notice in the *Times*, contributed by Sir Humphry Rolleston, reminds me of an interesting piece of prophecy in which Bradford and Rolleston were associated. Somewhere about 1895—forty years ago—I was sub-editing the *Practitioner*, and had designed a "monthly review of the medical sciences," in which a special depart-

ment was reviewed each month by one of the rising young physicians of those days. Bradford was responsible for diseases of the kidneys and Rolleston for diseases of the digestive tract. One morning they were both in my waiting-room, where they met the late Dr. Michael Foster, an old friend of mine from San Remo and Harrogate. He came into my study first, and said: "I won't keep you long as you have two men in the waiting-room whom I know. Mark my words; they are both future Presidents of the Royal College of Physicians." Sir Humphry Rolleston was elected President in 1922 and Sir John Rose Bradford succeeded him in 1926. Bradford was an excellent organizer of congresses. The tercentenary celebration of the publication of Harvey's *De Motu Cordis* was primarily, if not entirely, a College affair, and was a great success. When the centenary of the birth of Lister came round in 1927 it was felt that King's College, University College, London University, the Royal College of Surgeons, and the Universities of Edinburgh and Glasgow, were all justified in celebrating their association with this great master. But Bradford had the wise idea of proposing that the Royal Society, of which Lister had been President, was the body to take chief charge of the event. With him as chairman of the executive committee, and Sir Henry Dale as secretary, we remember what a brilliant affair the celebration was. In commemorating both these events—the publication of Harvey's great work and the birth of Lister—Bradford's wise imagination and excellent conduct added to the reputation of the Royal College which he served so well.

Dr. ARTHUR MACNALTY writes:

It is with deep regret that I have heard of the death of my old chief and friend, Sir John Rose Bradford. I had the privilege of being first his clinical clerk and afterwards his house-physician at University College Hospital, and these associations enabled me not only to realize how great a man he was but also how lovable. I can find no other word to express the feelings of personal affection with which he inspired those who really knew him. He was a great physician and a great teacher. When he was professor of medicine his 9 o'clock lectures at University College were always delivered to crowded benches. His tall, soldierly figure stood by the table, and he recited in measured, balanced terms the teaching of medicine without notes or hesitation, each lecture original, impressive, and erudite, a marvel of memory and learning. Alas! that such learning survives only in the recollection and notebooks of his students, and that in the press of administrative and other work he never found time to write a book on medicine. He wedded his immense knowledge of physiology and pathology to the study of clinical medicine, and it is only in these latter days that his methods of approach are being recognized and valued. His last address at University College Hospital (October, 1934) was devoted to this subject, which he made peculiarly his own.

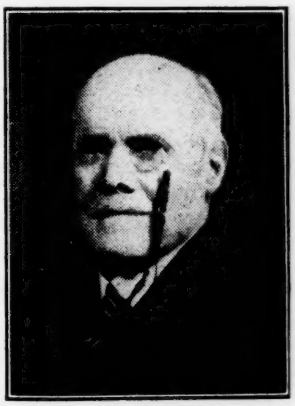
Except with his professional brethren, he was never popular as a consultant, for he knew so much that those private patients who liked cut-and-dried diagnoses were repelled by the wealth of wisdom which he lavished over what to most would have appeared an ordinary case. One instance of this may be recalled. It was Bradford's well-known custom in the wards to question the clinical clerk in charge of the case on the signs and symptoms exhibited by the patient. A case of nervous disease came in and the earnest clerk read up all the textbooks dealing with the subject in anticipation of the Chief's visit. In the pride of his youth, the boy answered all Sir John's questions fluently. Nystagmus, intention tremor, ankle-clonus—all had been elicited. Then Bradford asked, "What is the diagnosis?" "Disseminated sclerosis," came the prompt reply. Sir John shook his clerk playfully by the arm. "Yes, but you know, Mr. So-and-so," he said, "you have not told me anything yet that would justify that diagnosis," and then he launched out into a brilliant exposition of differential diagnosis of diseases of the central nervous system.

Bradford was always kind, never impatient, a wise councillor, and the most unassuming of men, ever ready to recognize and even over-appreciate the work of his colleagues, especially the younger ones. A great leader in medicine has left us.

SIR JOHN COLLIE, C.M.G., M.D.

Chief Medical Officer of the Metropolitan Water Board

Following a long illness Sir John Collie died in London on April 4th, at the age of 74. He was the fourth son of the late James Collie, advocate, of Pitfodles, Aberdeenshire, and was educated at Aberdeen University, whence he graduated as M.B. in 1882, proceeding to his doctorate three years later. After a few years of industrial practice in the North of England Collie came to London, where he presently began to come prominently into public notice through his work as medical examiner to the Water Board, the London County Council, and other bodies. This was owing to the publicity which attached to his work in detecting and exposing cases of malingering and attempts to defraud these and other large corporations which administer ample funds. Having effectively safeguarded the interests of the community, as he regarded it, Collie was not the man to hide his light under a bushel; and the result was that in popular estimation he was quite wrongly regarded as a hard-hearted official devoid of all human sympathies. Nothing could have been further from the truth: in the vast majority of the cases upon which he had to report no suspicion of malingering arose, and he was a kindly and sympathetic physician, who often went out of his way to advise and help the examinee. On the other hand, it has to be admitted that many who went before him were so intimidated by his reputation that they were either hostile or unable to do themselves justice; and although his manifest fairness and kindliness impressed most of these, there were others who remained inaccessible. His own medical subordinates had only to discharge their duties properly and punctually to secure his cordial support and encouragement; he was a good chief to work for, provided one was willing to give of one's best.



Collie's published works included: *Fraud and its Detection in Accident Insurance Cases* (1912); *Malingering* (1913, and a second edition in 1917); and *Fraud in Medico-Legal Practice* (1932). During the war his services were naturally taken advantage of by the Army, and he became a temporary colonel in the Army Medical Services, where his experience of malingering was especially valuable: he was mentioned in dispatches, and his services were recognized in 1918 by the bestowal of the C.M.G. He had already been created a Knight Bachelor in 1912. In 1919 Collie was appointed deputy coroner for the Hatfield district of St. Albans, became M.P. for the Partick Division of Glasgow as a Liberal in 1922, and later stood as an anti-waste candidate in London, but was not successful: he was also a J.P. and a deputy lieutenant for the

county of London. He married in 1886 Miss Jessie Edgar, who died in 1928, leaving one son, Dr. Arnold Collie; and, second, Elsie, widow of Sir William Arrol.

Sir John Collie's photograph reveals a face which suggests great determination as well as vivid intelligence. He was extremely outspoken, and took little trouble to conciliate those who did not agree with him; this resulted in an underestimate of the genuine kindliness of his nature and his real good-heartedness by those who judged him superficially. But there is no doubt that his work and his writings were of genuine service to his own and to succeeding generations, by making much more difficult the path of the malingerer and the fraudulent claimant, and this is the verdict on his career upon which he would most have prided himself if he could have anticipated it.

[The photograph reproduced is by Hay Wrightson.]

SIR JAMES MICHELLI, C.M.G.

The death is announced of Sir James Michelli, late secretary of the Seamen's Hospital and honorary treasurer of that society at the time of his death. Sir James was 82, and served the Seamen's Hospital Society for over forty years in an active capacity. Probably no other hospital secretary was so widely known to generations of medical men as he was. He lived in an era when a great and unprecedented expansion of the work of this society took place, and in this he was the main inspiration, for when he joined the Seamen's Hospital Society, in 1887, the establishment consisted of the parent hospital, the Dreadnought Hospital, alone. Since that time the work has expanded to include no fewer than four large hospitals, a tuberculosis sanatorium for seamen at Bramshot, and the convalescent home at Cudham in Kent. Naturally, all this entailed a vast increase in the society's income, for which Michelli was primarily responsible, and so he developed the faculty of raising funds for his charity to almost the same extent as that prince of beggars, the late Lord Knutsford. For his services to tropical medicine in general, and for the teaching of this branch of medicine in London in particular, he will always be held in high honour, for without Michelli it is probable that the London School of Tropical Medicine, which was instituted under his guidance in 1899, and its subsequent unexpected expansion, would not have existed. For these services he was made a C.M.G. in 1906, and knighted in 1921.

Doctors who came under his sway were drawn towards him, not only by his administrative talents, but also by his charming personality, approachability, and affability, and his services were always at the disposal of every well-intentioned houseman or medical superintendent. He gave to his staff much more than is expected in general of a hospital secretary. Moreover, his conduct of medical councils and hospital administration has been taken as a model by succeeding generations. His knowledge of hospital procedure was as encyclopaedic as it was unique.

COLONEL W. G. KING, C.I.E.

Colonel Walter Gawen King, C.I.E., Madras Medical Service (retired), died at Hendon on April 4th, aged 83. He was born on December 4th, 1851, the son of Mr. John Henry King of the Marine Dispensary, Greenwich, and was educated at Aberdeen, where he graduated M.B. and C.M. in 1873, subsequently taking the D.P.H. there in 1888. Entering the I.M.S. as surgeon in 1874, he became full colonel in 1905, and retired in 1910. During his service he held many important posts. After his first two years of military service, and various civil surgeoncies in the Madras Presidency, he was successively professor of physics in the Madras Presidency College, and of hygiene in the Madras Medical College, special sanitary officer of Madras City, superintendent of the Mandalay Central Jail, superintendent of the Government Lunatic Asylum, Madras, deputy sanitary commissioner, Madras, and finally, in 1894, sanitary commissioner of Madras Presidency. On promotion to administrative rank he became inspector-general of civil hospitals and sanitary commissioner of Burma. In his early years he distinguished himself in the work of famine relief in the great Madras famine of 1876–7, and again twenty years later, as sanitary commissioner, in another famine. On both occasions he received the thanks of the Government, and in 1899 he was awarded the C.I.E. Rejoining the Service in the war, he was A.D.M.S. in the Western Command, and later consultant to the Tropical Diseases Clinic at the Ministry of Pensions, and lecturer in tropical hygiene at King's College, London. Partly through his labours and advocacy the research institute was opened at Guindy in 1903; it was named after him by the Government, the King Institute of Preventive Medicine. He was the author of *The Cultivation of Animal Vaccine*, 1891; *The Plague Inspector's Manual*, 1902; and *Sanitary Rules for the Prevention of Plague in Municipalities*, 1903. He had been a member of the British Medical Association for over half a century, since January, 1884, and had been specially elected an associate member of the South Indian and Madras Branch.

Dr. CHARLES HOLMAN GIVAN ROSS of Navan, County Meath, died on March 24th at the age of 52. He was educated at the Collegiate School, Monaghan, and the Catholic University, Dublin, where he graduated M.B., B.Ch., B.A.O. of the Royal University of Ireland in 1906, and obtained the L.R.C.P. four years later. He served for two years as house-surgeon at the Meath Hospital, Dublin, starting general practice in Navan twenty-three years ago, and he became very popular over a wide area. He was surgeon to the Meath County Infirmary in Navan, and was highly esteemed for his skill and sympathy. During the war he held a commission in the Royal Army Medical Corps, serving in France. He became a member of the British Medical Association in 1922.

The death of Dr. JOSEPH SHARDLOW of Hove, at the age of 63, took place on March 31st after a long and painful illness. He received his medical education at University College Hospital, where he took the double Conjoint qualifications, and graduated M.B.Lond., after holding the appointments of house-physician and junior demonstrator at his hospital. He was later resident medical officer at the East London Hospital for Children at Shadwell. He settled in practice in Brighton over thirty years ago, and took a special interest in obstetrics, being appointed obstetric physician to the Women's Hospital at Brighton, a post he held till the time of his death. He was also honorary medical officer to the Brighton and Hove Dispensary. Dr. Shardlow devoted a great deal of time to ambulance work, acting as teacher and examiner for the St. John Ambulance Association, and his services were recognized by that association, which made him a life member. He joined the British Medical Association in 1900, and was a member of the Brighton and Sussex Medico-Chirurgical Society. A memorial service was held at All Saints', Brighton, on April 3rd, at which many of Dr. Shardlow's colleagues and patients were present, and also representatives of the Sussex Maternity Hospital and St. John Ambulance Association. The interment took place the next day at Shardlow in Derbyshire. Dr. Shardlow did not take a very active part in the work of the B.M.A. His chief interest, apart from his practice, was in ambulance work. His many patients and his colleagues will miss his skill and attention.

Medico-Legal

THE PATIENT AS TESTATOR

Part I.—General Considerations

The general practitioner, of all non-legal persons, needs the soundest practical knowledge of the law concerning wills, for his calling brings him every day into the closest touch with men and women who have not long to live and are anxious to dispose of their property. Many of these patients will expect him to know exactly how they ought to make a will and what they ought to say in it. Doctors, again, are often called as witnesses in lawsuits when a will is contested on the ground that the testator was mentally unfit to make it, and sometimes have to give evidence a long time after they attended the patient. If the witness has not taken special notice of the testator's mental state with reference to his capacity to make a will, he will not be able to help the court in the way he should by reason of his professional position, and will give a bad impression of his competence and intelligence. More important still, the doctor is constantly being asked to witness wills, and if he signs a will as witness he automatically guarantees that the testator had a "sound disposing mind." Moreover, patients not infrequently leave their doctors legacies. The law is very suspicious of a gift to a person in such a relationship to the giver that he might have been able to exercise "undue influence" over him. A doctor is sometimes obviously in such a position. In order, therefore, to avoid ever coming under suspicion of obtaining a legacy by undue influence, he must know what the law means by this phrase: what conduct it will regard as innocent and what may cause it to ask unpleasant questions.

A Sound Disposing Mind

The chief factors which may so affect a testator's mind as to make his will invalid are mental disease, mental deficiency, physical infirmity, senility, and drunkenness. These affect the quality of the mind itself. Other factors, without impairing the testator's mental capacity, hinder him from using it in an effective way; the chief of these are the deficiency of a special sense, such as deafness, dumbness, or blindness; fraud, coercion, or intimidation. Undue influence, of which more later, may come into either of these two last categories.

The principle on which the courts decide whether the testator was fit to make a particular will is quite a simple one, and fits all the cases in which the mind of a testator is impaired from one or other of these causes. To make a valid will a person must be of sound mind, memory, and understanding. The testator must be able to remember each and all of the persons who may be fitting objects of his bounty; and he must be able to understand their relationship to himself and their respective claims upon him. He need not be, in the ordinary sense of the word, completely sane, and he certainly need not have an accurately balanced mind. He may be feeble with age or racked with pain, and need not be completely sober. He may give way to caprice, whim, or malice, as he chooses; he may leave all his property to a mistress or a hospital and nothing at all to his wife and children. The law merely requires that he shall be of age and be acting of his own volition. This volition must be that of a mind of natural capacity, not unduly impaired by old age, enfeebled by illness, or tainted by morbid influence. Such a mind, to continue the words of Sir J. P. Wilde (afterwards Lord Penzance), a great former President of the Probate Division, the law calls a "sound disposing mind." This is the standard by which a doctor has to decide whether a testator has sufficient mental capacity to make a valid will. The decision is a difficult one in any given case, and all cases are different.

Mental Disorder and Testamentary Capacity

The most obvious factor depriving a testator of capacity is mental disease. The law very wisely does not attempt to define insanity, but looks at the actual state of mind of the particular testator at the time he made his will. The courts, however, still think in terms of "lucid interval" and "monomania," concepts at which psychiatrists tear their hair, but which the doctor must understand and appreciate if he is to be a helpful witness. If a testator has been known to be of unsound mind before making the will the court will only uphold the will if it is satisfied that the testator made it in a "lucid interval," no matter how short. This term has often been defined. Lord Thurlow, speaking of physical as well as mental illness,[1] said it must be not merely an abatement of pain or violence or of a higher state of torture, but an interval in which the mind, having thrown off the disease, has recovered its general habit. Sir John Nicoll[2] said, "It must be shown not merely that the party whose act is the subject of inquiry was restored to a state of calmness, and to the ability of holding rational conversation on some topics, but that his mind, having shaken off the disease, was again become perfect, was sound upon all subjects, and that no delusion remained." On the other hand, the court could hardly, and in fact does not, expect the mind to be completely restored to health. In the quaint words used in *Holyland* (1805), although the mind, after the removal of the distress, may labour under a languor and debility, yet it is enough to prove that the morbid affection no longer obscures or vitiates the judgement. The court will, however, jealously examine into the state of the testator to make sure that the disorder was really removed.

By "monomania" the courts mean a condition in which the testator, though perfectly rational in all other ways, is subject to delusions on one particular subject or group of subjects. To psychiatrists this is by no means a common form of insanity. The description fits more or less correctly the rare condition of paranoia, where the patient has a perfectly rationalized delusional system which does not disturb his general behaviour, but the mental physician knows that most deluded patients show many other signs of their disorder. If the testator has been known to suffer from delusions or hallucinations of such a kind that they render him unfit to make a valid will, the court will require proof that at the time he made his will he was entirely free from these delusions.

(To be concluded)

ANOTHER MISDESCRIBED CHARITY

A short time ago a testator set the courts a problem by leaving property to "the Middlesex Children's Hospital, Middlesex Street, London, W.," a description with at least three separate errors in it. At the end of last month a will came before Mr. Justice Farwell in the Chancery Division by which the testator left a considerable residue —about £42,000—to an institution which he described as "The King Edward VII Royal Hospital, London." There is no hospital of this name, but four institutions with similar names laid claim to the prize. These were: the King Edward Hospital Fund for London; King Edward VII Hospital for Officers (Sister Agnes Founder); the King Edward Memorial Hospital, Ealing; and the King Edward VII Hospital, Windsor.

The facts as recited in the judgement were as follows. The testator was a retired beer-seller, of little education, who resided in a small Lancashire town. He had cherished a great admiration for King Edward VII, and this feeling occupied his mind to some extent towards the end of his life. In October, 1930, he made a will leaving annuities to various

[1] Attorney-General *v.* Parnther (1792).

[2] Groom *v.* Thomas (1829).

people, and the whole of the residue of his real and personal estate on trust for "The King Edward VII Royal Hospital, London," declaring that the receipt of the treasurer of the aforesaid institution should be a sufficient discharge for the residuary trust fund. He died in July, 1933. As there exists no institution which corresponds to that named in the bequest, the judge had to consider extrinsic evidence of the testator's intention. The testator did not subscribe in any way to any one of the four institutions which claimed the property, nor was there the slightest evidence that at the date when he made his will he had any knowledge of any one of them. The King Edward Hospital Fund is an "institution," and shortly before the will was made it had engaged in considerable activity which had received publicity in various newspapers, including a paragraph in the newspaper which the testator took in. There was, however, no evidence that he had read this paragraph. There was nothing to indicate that the Fund was ever brought to the notice of the testator, or that he intended to benefit it, and it is certainly not a hospital. The King Edward VII Hospital, Windsor, is a general hospital, but its title does not contain the word "Royal" and it is not in London. The King Edward Memorial Hospital, Ealing, although it is situated in what is now a part of London, does not fall within the description in the testator's will.

The King Edward VII Hospital for Officers is a hospital in London, but admits only officers, and not the general public. It was quite clear, said Mr. Justice Farwell, that the testator at the time he made the will had no particular institution in his mind, and certainly not this particular hospital. He had seen in the newspapers that King Edward VII had taken great interest in hospitals, and had assisted them in many ways, and he had probably thought there must be some hospital in London which would come within the description in his will. On November 6th he wrote a letter to the Royal National Orthopaedic Hospital in London in the following terms: "Will you let me no weather there is a hospital called King Edward VII's Royal Hospital?" and then followed the word "London," with a line through it. In answer to this letter the secretary wrote saying: "Dear Sir, There is a King Edward's Hospital at Windsor, and there is a King Edward's Hospital for Officers in Grosvenor Crescent, London." The learned judge doubted whether this letter was admissible in evidence at all, but, even assuming it were, he did not think it carried the matter any further. After its receipt the testator did not think it necessary to alter his will; he left a description which did not really fit either of the hospitals that were mentioned, and the judge thought it would be guessing to say that the testator intended to benefit the hospital which was mentioned in the letter. None of the four claimants, therefore, seemed to be the institution which the testator had intended to benefit under his will.

Mr. Justice Farwell distinguished this case from the one concerning the Middlesex Hospital. In that case, he recalled, there was only one claimant, and the Court of Appeal had been able to come to the conclusion that the description was sufficient to enable it to say that the Middlesex Hospital was the hospital which was intended by the inaccurate description. In the present case all the four claimants had to some extent argued against each other. So cogent, he said, was the argument of each of these protagonists that it made it impossible for him to find in favour of the others. It remained for him to decide whether or not the testator had shown a general intent to benefit charity, in which case the court can order that disposition of the estate which it considers will most nearly interpret the intention of the testator. After counsel had conferred together, Mr. Justice Farwell consented to a settlement by which the next of kin will receive a portion of the residue and the remainder will be allotted according to a scheme to be drawn up in chambers.

This entertaining contest, in which no fewer than five King's Counsel, together with more than that number of junior members of the Bar, were engaged, must have cost a fair proportion of the residuary estate. It indicates the necessity for strenuous efforts on the part of institutions and solicitors to induce testators with charitable intentions to describe their beneficiaries properly in their wills.

Medical News

The committee of the Athenaeum has elected Professor Francis R. Fraser, M.D., F.R.C.P., under Rule II of the club, which empowers the annual election of a certain number of persons of distinguished eminence in science, literature, the arts, or for public service.

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, April 17th, at 5.30 p.m., when a paper will be read by Dr. B. H. Knight, and Mr. P. Swift will exhibit and describe some new types of petrological microscopes and equipment.

The annual meeting of the Institute of Medical Psychology will be held at the Wharncliffe Rooms, Great Central Hotel, N.W., on Monday, April 15th, when addresses will be given by the chairman, Sir Henry Brackenbury, and the joint treasurer, Lord Hollenden. At the luncheon party afterwards Lord Allen of Hurtwood and Dr. J. R. Rees, medical director of the institute, will speak.

At the next meeting of the Chelsea Clinical Society, to be held at the Hotel Rembrandt, Thurloe Place, S.W., on Tuesday, April 16th, at 8.30 p.m., Mr. A. S. Blundell Bankart and Mr. Frank Romer will open a discussion on manipulative methods. The meeting will be preceded by dinner at 7.30 p.m.

A special meeting of the Medical Society of Individual Psychology will be held at 11, Chandos Street, W., on Thursday, May 2nd, at 8.30 p.m., when the president, Dr. Adler, will speak on "Individual Psychology in General Practice."

A meeting of the Section of Urology of the Royal Society of Medicine will be held in Paris on Friday and Saturday, April 26th and 27th. On April 26th, from 9 a.m., visits will be paid to the Hôpital Lariboisière, conducted by Dr. Heitz-Boyer, and to the Hôpital Saint-Joseph, conducted by Dr. Papin. On April 27th, from 9 a.m., the Hôpital Necker and the Hôpital Saint-Louis will be visited under the guidance of Professor Marion and Dr. Gouverneur respectively. Accommodation has been reserved at the Hotel Astor, 11, Rue d'Astorg.

The centenary of St. Mark's Hospital will be celebrated by a dinner at the Mansion House on Thursday, April 25th, with the Lord Mayor of London, who is president of the hospital, in the chair.

A lecture on contraception will be given to medical students and practitioners by Dr. Gladys Cox on Friday, May 3rd, at 6 p.m., at the Walworth Women's Welfare Centre, 153A, East Street, S.E.17 (1d. bus or tram from the Elephant and Castle or Camberwell Green). Practical demonstrations will be given at 6 and 7 p.m. on May 10th and at 6 and 7 p.m. on May 17th. Tickets of admission to the lecture should be applied for in advance, with an indication of the day and time preferred for attending a demonstration. Those attending a demonstration should bring rubber gloves, and, in order to help to cover the expenses of lecture and demonstrations, a fee of 5s. is charged.

An international post-graduate course in surgery, to be held in Berlin from April 29th to May 4th, will comprise surgical operations, visits to clinics, and lectures ranging over a wide field, including gynaecology and radiotherapy. The fee for the course is 70 reichsmarks, and details may be obtained from Dr. Sahm, Berlin Academy for International Post-Graduate Courses, Robert Koch Platz 7, Berlin, N.W.7.

A post-graduate course commenced at the Dundee Royal Infirmary on April 11th and will be continued on Thursdays, at 3.15 p.m., until May 30th. No fees will be charged for the lectures and demonstrations, but there will be a registration fee of £1 1s. to cover expenses of printing, etc. Tea will be provided at 4 p.m.

The House of the British Medical Association, including the Library, will be closed for the Easter holiday from 6 p.m. on Thursday, April 18th, until 9 a.m. on Tuesday, April 23rd.

The House of the Royal Society of Medicine, including the Library, will be closed for the Easter holiday from Thursday, April 18th, to Tuesday, April 23rd, both days inclusive.

The Fellowship of Medicine (1, Wimpole Street, W.) announces that a course in psychological medicine will be given at Maudsley Hospital from April 23rd to May 31st. Other forthcoming courses include: dermatology at St. John's Hospital, April 29th to June 1st; medicine, surgery, and gynaecology at Royal Waterloo Hospital, April 29th to May 11th; thoracic surgery at Brompton Hospital, May 13th to 18th; M.R.C.P. course in chest diseases at Brompton Hospital, in June; M.R.C.P. course in chest and heart diseases at Victoria Park Hospital, in June; M.R.C.P. evening clinical and pathological class, in June. Week-end courses include cardiology at Victoria Park Hospital on May 4th and 5th; chest diseases at Brompton Hospital on May 11th and 12th; fevers at Park Hospital June 15th and 16th. A supper-dance and cabaret will take place at Claridges on Wednesday, June 5th, full details of which will be available shortly. Courses of instruction, clinics, etc., arranged by the Fellowship, are open only to members and associates, with the exception of the course at St. John's Hospital and the supper-dance.

The fifteenth International Congress of Physiology will be held in Leningrad and Moscow from August 9th to 17th, with Professor Pavlov as president. The subscription is 10 roubles. Further information can be obtained from Main P.O. Box 13, Leningrad.

Under the will of the late Dr. G. H. Rodman, a past president and honorary fellow of the Royal Photographic Society, provision was made for a medal, to be known as the Rodman Medal, to be awarded annually at the society's annual exhibition, with particular reference to photomicrography and/or *x*-ray photography. The exhibition this year will be held at 35, Russell Square, W.C., from September 14th to October 12th. A further special award of £5 5s., placed at the disposal of the council by Professor J. M. Woodburn Morison, M.D., will be available for the best *x*-ray photograph in this year's exhibition.

In memory of her brother, Professor J. Hill Abram, who occupied the chair of therapeutics in the University of Liverpool from 1908 to 1922 and the chair of medicine from 1922 to 1924, Miss Abram has made a gift for the provision in the medical school of prizes in medicine and pharmacology.

Among the bequests of Miss Ida Louisa Benecke of West Hampstead are £1,000 each to the Elizabeth Garrett Anderson Hospital; to the Middlesex Hospital for the benefit of cancer patients; to the Mental After-care Association; to the Royal Free Hospital for the London School of Medicine for Women; and to the Royal London Ophthalmic Hospital. Also £500 to the Hampstead General and North-West London Hospital.

The Medical Research Council has agreed to act as trustee in administering a benefaction of £4,000 provided by the Stock Exchange Dramatic and Operatic Society and named in honour of the secretary of the society, Mr. Hugh S. Quekett. The purpose of the gift is the promotion of research into the value of short-wave radiation in the treatment of disease. The money will be used by the Council to meet the cost of assistance and special apparatus in experimental and clinical investigations to be made at the London Hospital under the direction of Professor D. T. Harris, Dr. E. May, and Sir Robert Stanton Woods.

A gift of electrical equipment costing £6,000 has been made to the Bristol General Hospital by Miss Hilda P. Wills.

The Minister of Health has appointed Mr. C. F. Roundell, C.B.E., to be chief general inspector in the Ministry of Health.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, four lines).

The **TELEGRAPHIC ADDRESSES** are:
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Recurrent Erysipelas in the Leg

Mr. W. A. REES (Swanage) writes: I should be grateful for advice in the treatment of a lady, aged 50, who has recurrent attacks of erysipelas in the leg: she has had three severe ones in twenty months. The first attack originated from a minute cut on one toe, but the subsequent attacks have come on in the same leg without apparent cause. Is there any suitable vaccine which would prevent the attacks?

Income Tax

Replacement of Car

"B. G." bought a second-hand car in 1933 for £28, and sold it in 1934 for £23, purchasing another for £55. He expects to effect a further exchange (and improvement) during 1935. About two-thirds of the use of the car is "professional" and one-third "pleasure."

∴ Seeing that the transactions are frequent "B. G." is advised to claim replacement expense in lieu of the annual depreciation allowance. The amount of the claim against the 1934 receipts is £28 − £23 = £5; the balance of the expenditure represents capital outlay. Of the £5, one-third will presumably be excluded as relating to "pleasure" use. If the car purchased in 1935 should be intended to serve for a number of years it might be advisable for "B. G." to change over to the "depreciation" basis of allowance for the financial year 1937–8—or even for 1936–7, though that would necessitate dropping the "replacement expense" claim against the 1935 receipts, as both allowances cannot be claimed to affect the same financial year.

Subscriptions to Medical Societies

"O. F." holds an appointment as medical superintendent of a sanatorium, and receives certain panel fees for treatment of the staff. Can he deduct the cost of subscriptions to medical societies?

∴ As regards the former emoluments the answer is "No," unless it is a condition of his employment that he should be a member of the societies—decision in Simpson *v.* Tate. That condition does not apply to the assessment of the panel fees, but it is probable that those fees are comparatively small and the subscriptions are hardly a fair charge against that part of his total earnings. At the same time "O. F.'s" claim in equity is strong, and a generous proportion may well be allowed—say, 50 per cent.—against the panel fees.

LETTERS, NOTES, ETC.

Diphtheria Immunization

Dr. C. H. FOLEY writes from Athenry, Co. Galway: The following cases may be of interest in relation to the question of diphtheria immunization. Last Christmas Day I was called to see a case of diphtheria of virulent form in a school child who had had three injections of T.A.M. in the previous September. The child's home was in a clean, well-kept, railway crossing cottage. Two other children had also been immunized, each with three injections of T.A.M. A fourth child had not been immunized, and I gave it 2,000 units of fresh diphtheria antitoxin, and also immunized the father and mother with similar doses of antitoxin. In the next two days a second child in that cottage, who had also received three injections of T.A.M. in September, developed diphtheria. This time I immunized the third child, who had also been given three injections of T.A.M., with antitoxic serum. It did not develop diphtheria. On February 3rd I was called, in the same area, to the well-kept home of a small farmer, who had five children. Four of these had each received three injections of T.A.M., also in September, three of them being school children. The eldest had a severe attack of diphtheria, and I immunized with serum the younger child and the mother and father. None of these children had got injections of T.A.M. from me. All patients were removed to hospital, and complete disinfection was carried out. A second child, who also had received three injections of T.A.M., developed diphtheria, and was seen by me yesterday; and I immunized with anti-diphtheria serum the two remaining children "protected" by three injections of T.A.M. in September. The diagnosis was confirmed in all but one case, the report on which is not yet to hand. I heard of a fifth—not in my area. Here is a country school in a healthy rural district, with a small average, say fifty children, all immunized with three injections of T.A.M., yet at least five, if not more, develop not mild but severe diphtheria. Does it matter really what we say when the public judges treatment by results? In defence of T.A.M. various reasons are given; but any one of these reasons would equally apply to the proper use of serum antitoxin. The manufacturers guarantee serum only if kept at a refrigerator temperature of 5° to 15° C. This applies also to anti-pneumococcus, anti-streptococcus, and anti-tetanus serum. Now as a general practitioner I am forced by circumstances to keep my serum in a drawer in a hall, but beneath a wall thermometer, at which I glance frequently. I dare say that there is no medical man to-day who can postulate a judgement on the value of this or that serum, or decide on the question of dosage, until the general practitioner can be informed as to how to keep serum safely stored (*a*) in his house or surgery, and (*b*) in his car, at a proper temperature.

Fungous Infection of Toes

"M.D." writes: I have suffered for many years from a fungous disease of the interdigital spaces of the feet, which has subsequently invaded the nails, and I obtained little or no benefit from the various methods of treatment in vogue. Experience has convinced me that the best treatment of the interdigital manifestations is to dip the toes in ordinary paraffin every day for a minute or two, putting on the socks with the toes still dripping with paraffin. It may be necessary to pare the nails should they have undergone thickening in order to facilitate access. The disease not infrequently spreads to the nails of the hands, and in such cases nothing acts more promptly and satisfactorily than paraffin, which, by the way, does not appear to irritate in the slightest. It may take several weeks to make a complete cure.

Cancer and Radium Water

"A. G." (Bathford) writes: The recent work of Professors Cook and Dodds on cancer, reported by the Medical Research Council, suggests a further investigation. These workers have observed the similarity in chemical structure that exists between certain carcinogenic substances and the sex hormone oestrin. "Synthetic compounds of this type, it is stated, have indeed been prepared which possess the power both of inducing tumour growth and of sex excitement." It is therefore thought that there may be some relation between the cell multiplication of normal pregnancy and that of malignant tumours. I suggest that trial might be made of feeding experimental animals on radium-impregnated water, in order to see whether sterility would result, or whether any inhibitory effect was thereby produced on the process of pregnancy. The question of the possible value in cancer of drinking radium emanation water is raised also by an experience of my own. Many years ago I took a course of such treatment for arthritis, the only apparent result of which was the disappearance of a wart, which had been for some years on my finger. In view of the work of Dr. A. F. Watson (*Journal*, December 8th, 1934, p. 1062), which indicates that there may be a "possibility of experimentally modifying the susceptibility of tissues to the development of malignancy," it seems not impossible that radium may exert some chemical influence inimical to growths besides that of direct destruction of the cells. With the idea of bringing about some such change in the tissues as Dr. Watson describes, the drinking of radium water might be thought to be worth a trial to reinforce local treatment by radium; in inoperable cases, especially, as my friend Mr. A. Leech-Wilkinson suggests, in cancer of the stomach, and as a prophylactic measure against recurrence of the disease. The water I drank during a six weeks' course was obtained fresh daily from the Radium Institute, and was of "an average content of from 0.5 to 1 mc. of radon per litre."

Samples of Ergometrine

Mr. CHARLES ALEX. HILL (chairman and managing director, The British Drug Houses Ltd., Graham Street, N.1), in a letter dated April 1st, writes: The interest aroused by the recent announcement of the discovery of the new water-soluble solution of ergot—ergometrine—by Chassar Moir and Dudley will probably have made some obstetricians wishful to try the clinical use of a substance of such high promise. By the application of the published details of methods employed by the above-mentioned workers, the scientific staff of this company has already prepared some ergometrine with a view to its production on an industrial scale, and I write to state that a sample tube of tablets, each containing 0.5 mg. of ergometrine, will be sent without charge to any obstetrician who applies.

Boots Medical Products

Boots Pure Drug Co. Ltd. have published a pamphlet giving brief descriptions of the special medical products prepared in their laboratories. It has a useful thumb index for ready reference to the various preparations, and the general index on page 7 enumerates alphabetically the name of each product and indicates the page on which particulars are available. Copies will be sent to members of the medical profession on application to Boots Pure Drug Co. Ltd., Wholesale and Export Department, Station Street, Nottingham.

A Waiting Room Indicator

The L. C. Smith & Corona Typewriter Company have brought out a time-saving indicator for use in hospital out-patient departments. An interchangeable stencil is provided bearing the name of the doctor and the words "Next please." When a button is depressed in the surgery the patient waiting outside is called in by seeing the words on the panel. This device has been found a considerable improvement on the old type of bell-calling system.

A Bath for Small Dwellings

Representatives of the Ministry of Health, Board of Trade, L.C.C., several of the metropolitan boroughs, Members of Parliament, and others interested in housing and public health matters recently attended a demonstration at the Hotel Metropole, London, of a new type of bath for working-class dwellings. The bath, which is also a kitchen table, sink and draining board, wash basin and home laundry, is intended for old property in which there is no bathroom or for new property in which the provision of a separate room for a bath would be uneconomic. It is called the "five-purpose bath," and is sponsored by the International Bath Association, which includes 90 per cent. of the British manufacturers. It will be made by all the leading bath founders in England and Scotland. Apart from working-class houses, it is believed that the five-purpose bath may be useful for one-room flats, modern week-end bungalows, for nursery use, and in small middle-class houses as a second bath for the maid's use in kitchen or scullery.

Disclaimer

Dr. E. GRAHAM HOWE wishes to disclaim all responsibility for the misuse of his name which has taken place in certain advertising matter in the current number of *Psychic News*.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 54, 55, 56, 57, 58, 59, 62, and 63 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 60 and 61.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *144*.